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JAMES TRUMAN, D.D.S.,

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JOSEPH HEAD, M.D., D.D.S.

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Original Communications.[1]

ARTICULATION OF THE TEETH.[2]

BY ISAAC B. DAVENPORT, M.D., M.D.S., PARIS, FRANCE.

The old man who had lost all but two of his teeth and thanked God that those met, had some conception of the value of articulation.

Many people with the mouth half full of teeth could not thank God for more masticating surface than this old man had, because their teeth strike together so badly that only a few are capable of mastication. The fact that such are often pretty healthy people does not in the least prove that a very limited masticating surface is not most deleterious in its general effect. I believe the perfect articulation of the teeth is the true physiological basis towards which our operations should be directed. I have been criticised for assuming a perfect articulation as a standard, because I have not been able to show an absolutely perfect articulation; but this criticism is misleading and unjust.

In a paper on the "Dental Arches of Man" (read April 12, 1887, before the New York Odontological Society, and published in the

[1] The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

[2] Read before the American Dental Society of Europe, at Heidelberg, August, 1891.

Dental Cosmos in July of the same year) I showed the principles of perfect articulation, and illustrated the same not only by diagrams, but by models of mouths; of the latter, some were so perfect, except in minor details, as to well illustrate the perfect arch.

One may recognize that a defect exists without recognizing all that it involves. In order to realize the real import of an imperfection one must know what perfection is, how manifest, and what it implies, otherwise the attempt to correct faults will often result simply in changing one defect for another, perhaps a worse one.

We benefit our patients in proportion as we make their teeth approach the standard of perfection, and this cannot be done blindly and without a knowledge of what a correct articulation is and what it is able to accomplish, so it seems absurd to hear the statement "that we always have to do with imperfect articulations, and therefore the perfect standard is of no use to us."

That argument ought to be made use of only by those men whose vision is so short that they go cutting and digging about the mouth with perhaps the one noble idea of tooth salvation, but apparently regardless of *what the teeth were made for;* but theirs is not "*whole salvation*" which our Methodist friends would say "brings happiness as its fruit," but rather the miserable inheritance of unending repentance.

I have no patience for the dentists of the present day who go chopping about the mouth like the bushwhacker dentists before the glad day-dawn of dental science.

Nature never loses sight of perfection. *Deformities and useless variations are eternally destined to die out sooner or later*, and the fittest survive. In the slow process of evolution is one abiding faith.

The *standard* of perfection of an organ can never be lowered or diminished so long as its functional need exists.

While there are probably few perfect articulations, there are many that are imperfect; yet it is possible to learn what is perfect and what tends towards perfection, by observing articulations which most nearly answer the functional requirements; in time one comes to detect the discordant elements which, eliminated, leave a correct idea of perfect articulation.

In trying to discover that form of articulation most favorable to its greatest usefulness, permanence, and regularity, it became evident that some other method was needed than observation in the mouth, where only the outside of the teeth could be seen in

contact, or with whole models from which only an imperfect idea of the inside striking of the teeth could be had.

To overcome some of these difficulties the method of vertically cutting the articulated models from front to rear, and with triple hinge permit to open laterally as well as vertically, was devised. Fig. 19 represents such a model, the interior view of the articulation being directly exposed to view.

Antagonism seems to express the prevalent idea of articulation; but antagonism is just what is most objectionable in an articulation.

Teeth antagonize when they strike only here and there and prevent the other surfaces from touching. Figs. 17, *Y* and *Z*, external and internal views, and Figs. 20, *a* exterior and *b* interior view, are good examples of an antagonizing articulation. When thus arranged they may punch the food, but they cannot chew it. On the other hand, a correct articulation of the teeth secures their very highest masticatory functions. In other words, a perfect articulation is the harmonious adjustment to each other of two most beautifully complicated, uneven, triturating surfaces in such a way as to permit all the movements of mastication, each prominence or depression having special reference to the normal movements of mastication, and to change their form or direction would be to render such movements impossible.

When thus perfectly arranged the masticating surfaces slide upon and into each other, constituting a self-sharpening machine, made up of a complicated system of inclines, so balanced and bound together as to be practically permanent.

The forces being thus widely distributed, wear goes on slowly on all the surfaces alike, and the physiological process of pulp protection is never, or at least very seldom, overtaken by exposure of sensitive fibrillæ, as is often the case when but little masticating surface can be employed.

I show you a model from the mouth of a man sixty-three years old (Figs. 21, *a* and *b*). Although defective in some respects, nature did her work so well that dentists have never had much chance to make it worse, for no teeth have required to be filled except some small cavities in the wisdom teeth, and that recently. I don't know when the absent wisdom tooth was lost. The points of the cusps are worn hardly any more than the other surfaces of the teeth, and yet it may be inferred that the gentleman used his teeth with some vigor, for he consulted me on account of having accidentally split longitudinally a perfectly sound bicuspid while eating.

In my former paper I was under the impression that per-

fectly articulating teeth would finally wear flat, owing to the shortening of the bite, and the under jaw coming forward, the ends of the incisors and the cusps thus disappearing coincidently; but this case illustrates how the perfect adaptation to its function may tend towards the preservation of an organ.

I do not wish to weary you with too many details of the articulation, but refer you to my former study and paper, "The Dental Arches of Man," already mentioned.

I will simply run hastily over some of the old drawings (for convenience the original numbering is here retained), together with a few others and several new models, dwelling particularly only upon such points as seem not to have been usually understood in that paper.

Figs. 1, *A*, *B*, *C*, and *D* are the drawings which, though not perfect, represent an approach at least to the typical arch. I will drop the word typical in this place, however, as some have objected to its application to them, and simply call these very good arches; arches which combine most of the desirable qualities of articulation, such as continuous grinding surfaces, good contact for the most part inside and out, extensive contact possible on many planes without interfering with individual prominences. Slight overshutting of superior incisors permitting the cutting movement without throwing the back teeth too far out of relation. The lower incisors capable of moving backward upon the posterior inclines of the upper incisors just sufficiently to conduct the cusps of the back teeth into their normal depressions with the same sliding contact; the rotary motion being permitted without the normal extent of contact being disturbed, either by too long cuspids or by such malposition of the teeth as to entangle the cusps, for it must be borne in mind that when a cusp by a false contact interferes, being out of relation with the rest of the surfaces, the movement is either arrested, or if continued, the effect of the rotation is destroyed because one cusp must raise over the other, and that separates the other surfaces.

To resume, we find the arches mutually supporting and tending neither to irregularity, contraction, spreading, separation, anterior projection, nor flattening; wear evenly distributed, and consequently slow.

Altogether sufficiently well combined to give a fair idea of a perfect arrangement, Figs. 22, *a* (exterior) and *b* (interior view), show another very good articulation.

Fig. 3 develops the idea of the relation of regularly uneven

Fig. 1 *A*.

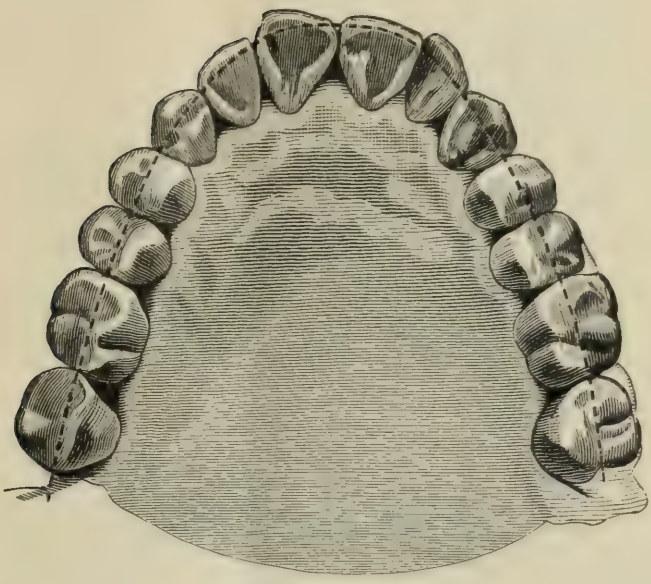


Fig. 1 *B*.

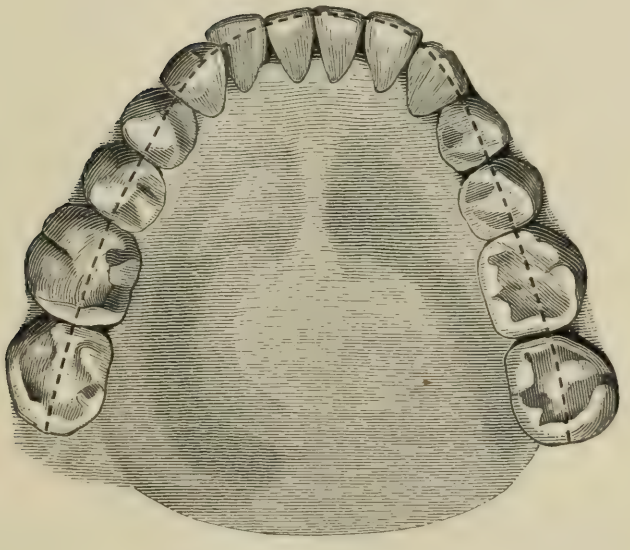


Fig. 1 *C*.

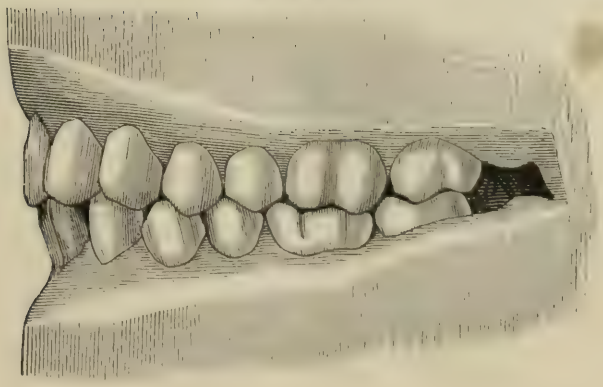


FIG. 1 *D*.

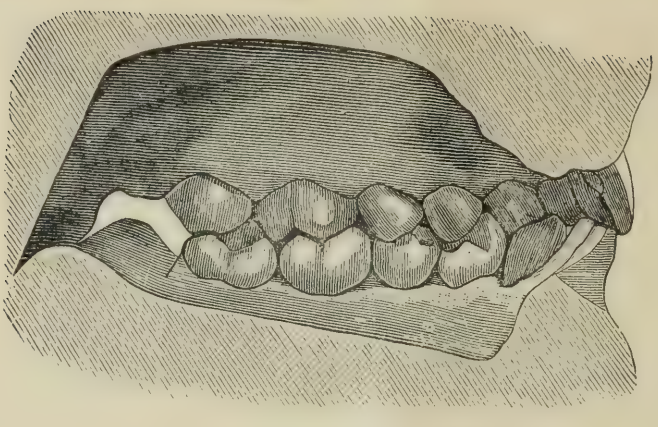


FIG. 8.

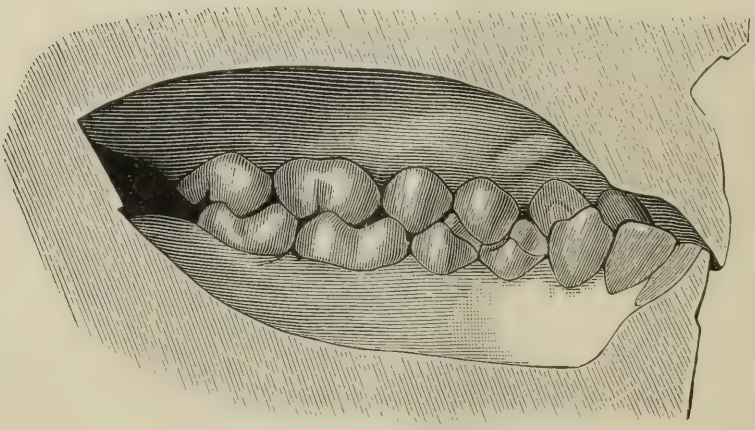


FIG. 9.

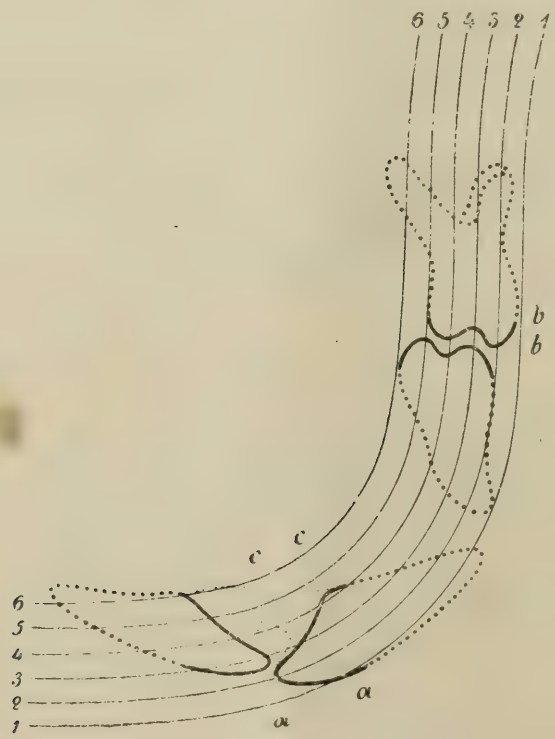


FIG. 3.

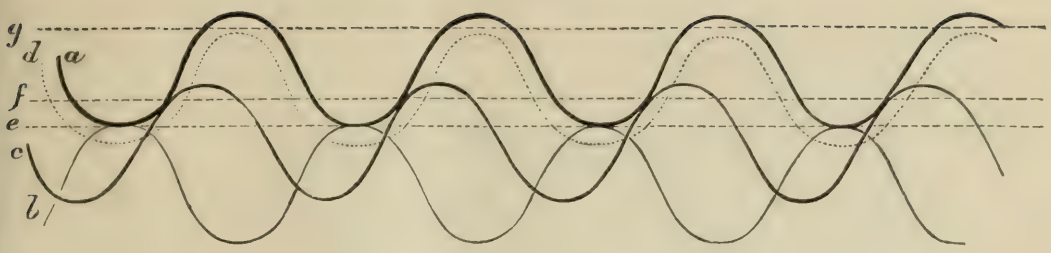
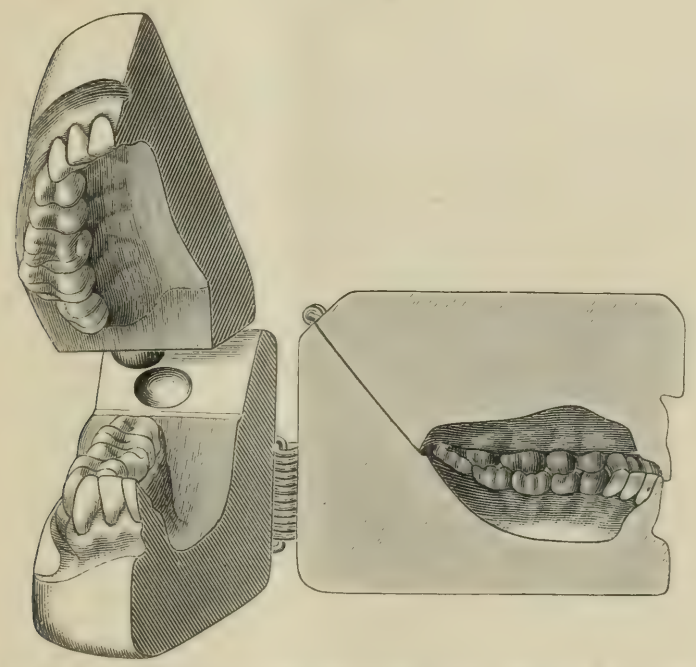
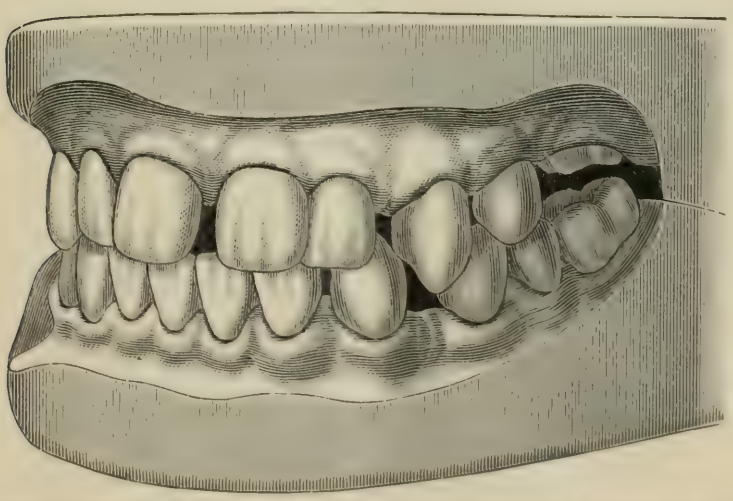


FIG. 19.



Shows a triple-hinged model, three-quarter size, open laterally, with teeth of left side shut and seen in profile from inside.

FIG. 23.



A nearly three-quarter view, right side, with teeth closed and showing the spaces.

FIG. 4.

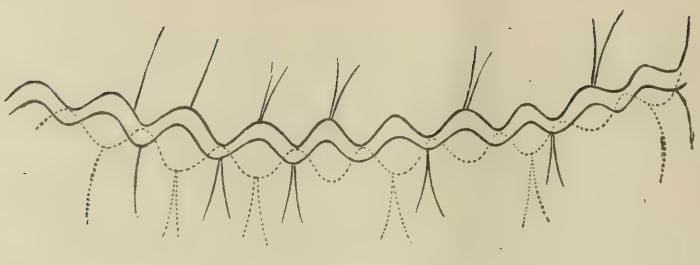
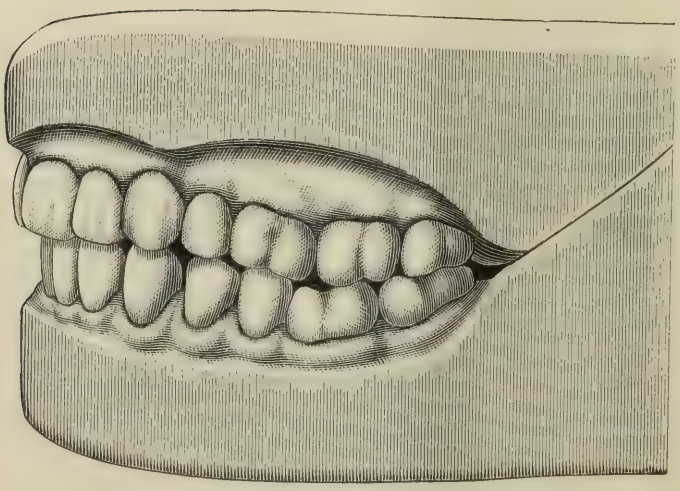
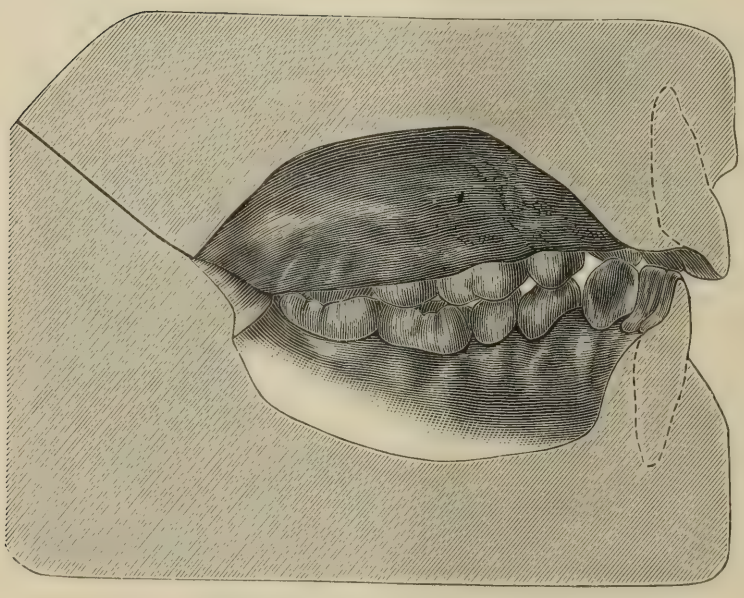


FIG. 20 *a*.



External profile, left side.

FIG. 20 *b*.



Interior profile, left side.

FIG. 5.

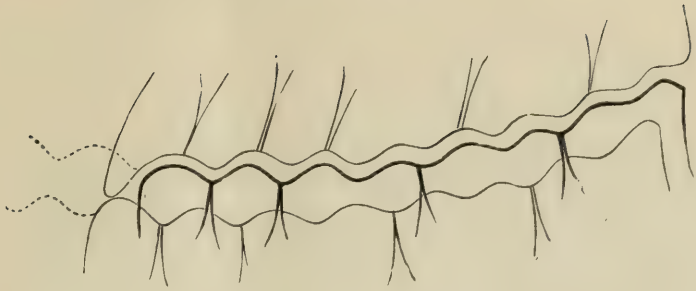
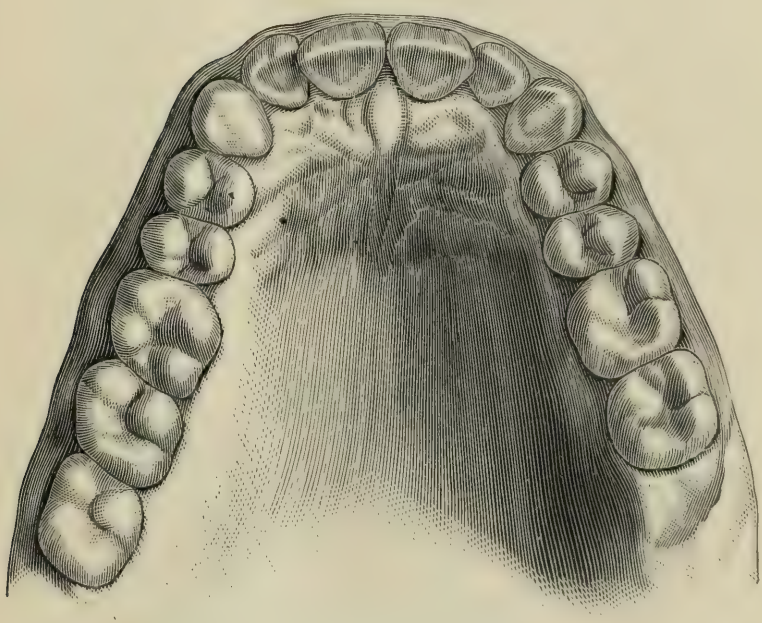
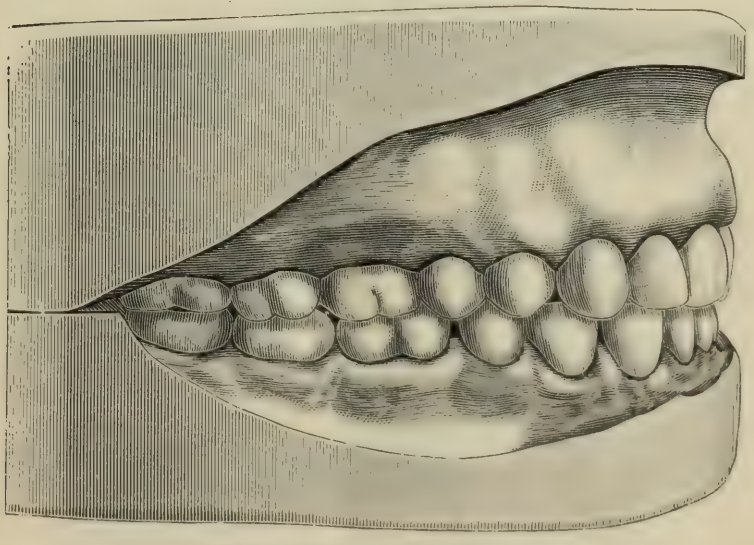


FIG. 21 *a*.



Upper teeth in perspective.

FIG. 21 *b*.



Exterior view, profile, right side.

Fig. 10.

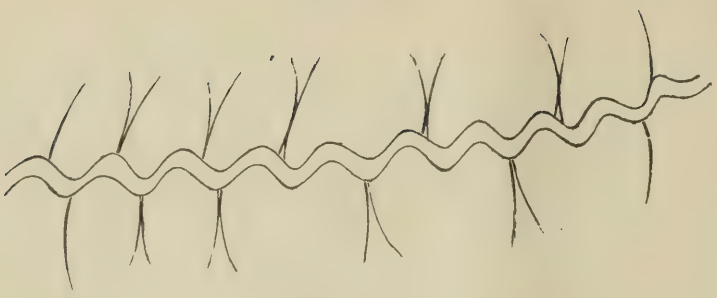


Fig. 11.

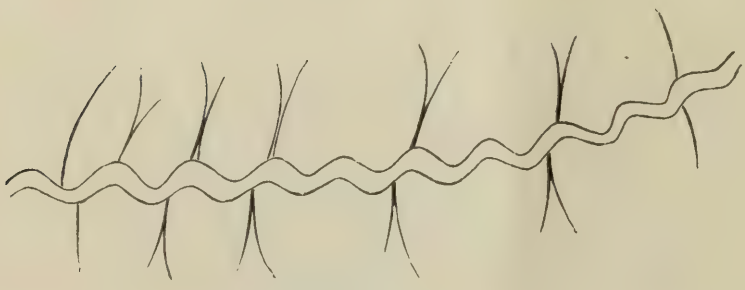


Fig. 17 *Y*.

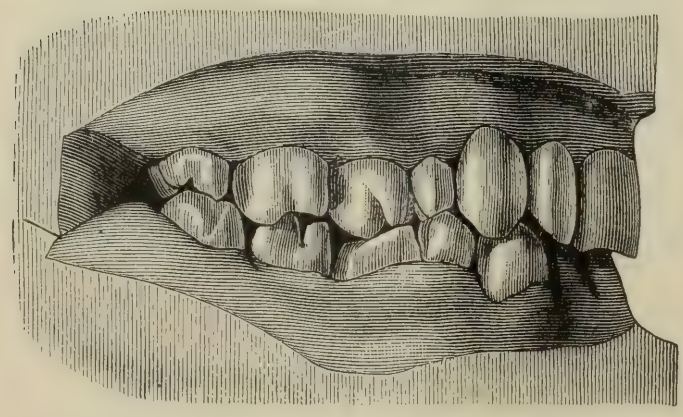


Fig. 17 *Z*.

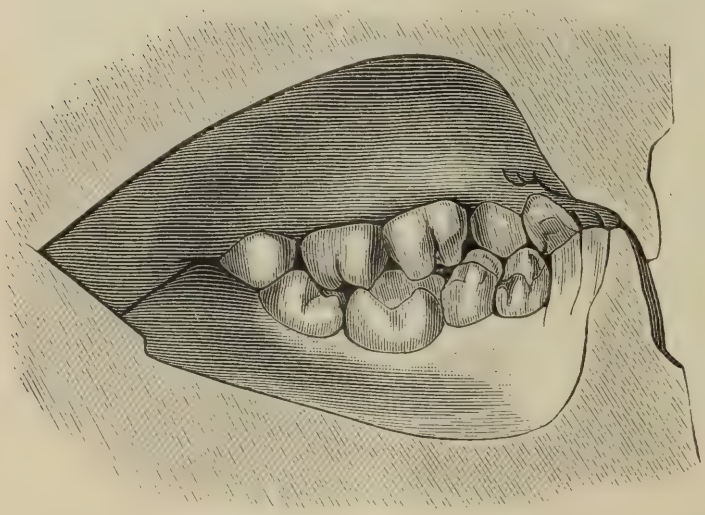
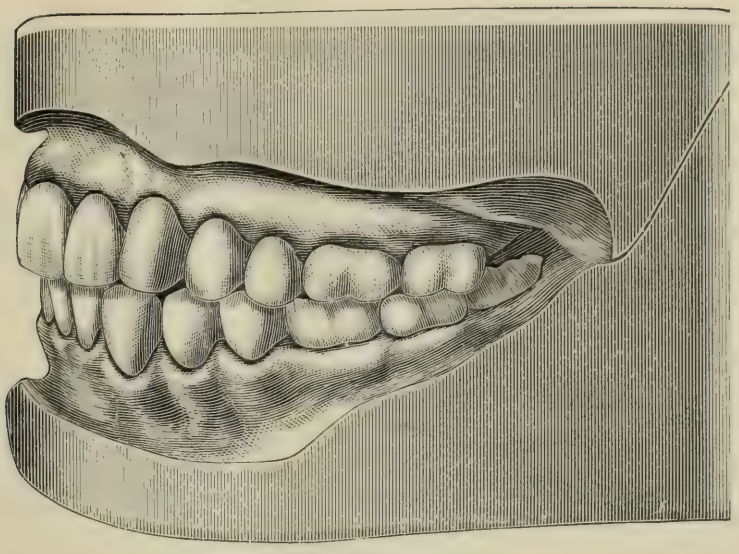
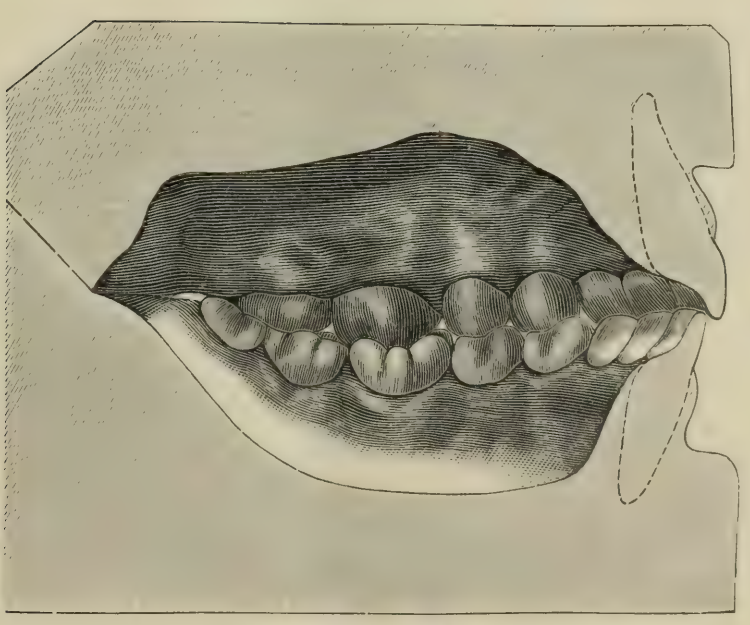


Fig. 22 *a*.



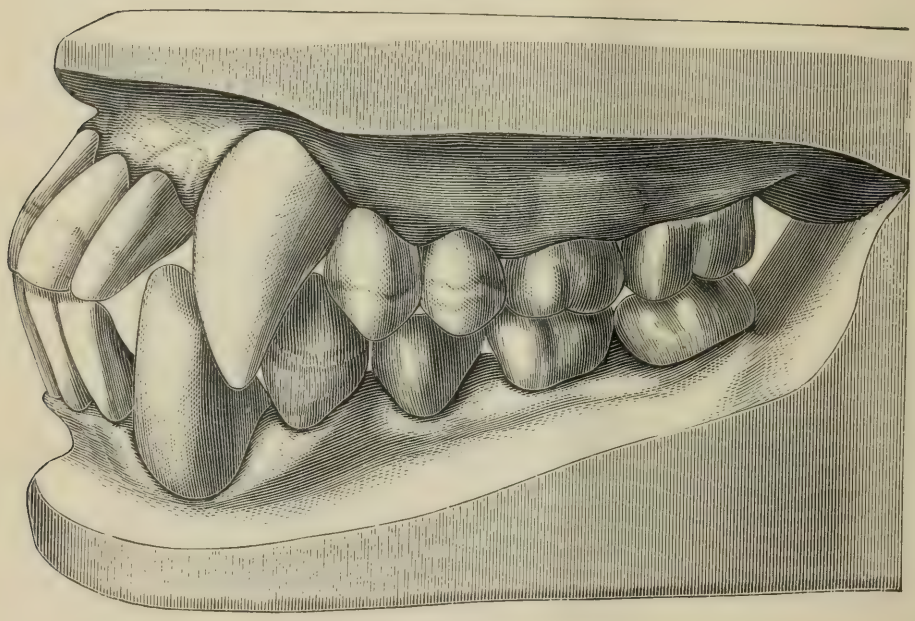
External profile, left side.

Fig. 22 *b*.



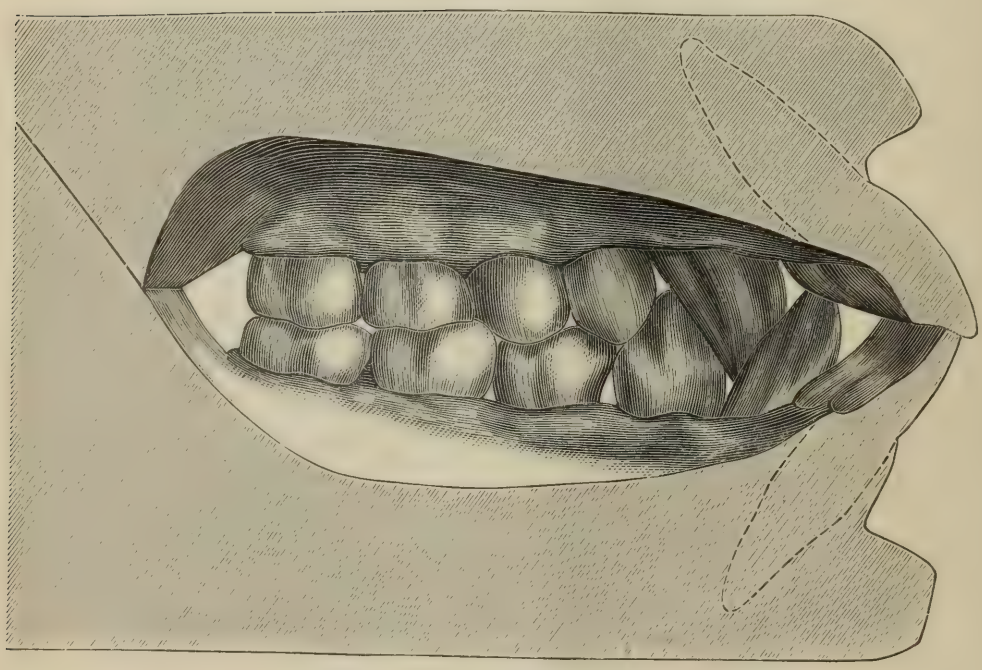
Interior profile, left side.

FIG. 24 *a*.



External view, profile, left side.

FIG. 24 *b*.



Interior view, profile, left side

surfaces, and of progressive contact from one plane to another. I say regularly uneven surfaces, because the unevenness recurs at regular intervals.

Fig. 4 is the application of Fig. 3 to the arches of man, the dotted lines representing the lower jaw in the forward position, as during the act of biting or cutting.

Fig. 5 shows how a long canine might destroy the effect of rotation by separating the molars, or how too far overshutting incisors would, during the act of cutting, widely separate the molars.

Now I must tell you that diagrams Figs. 4 and 5 are correct in regard to the divisions of the teeth upon one vertical plane only, and here is the point to understand of the whole question. They represent the teeth as they appear from the outside, the points of the upper cusps being just opposite the space between the lower teeth.

This of itself alone would be an element of weakness, the teeth in the bicuspid region would tend to fall apart by such a mutual wedging action, and the molars, being left without support, would tend to disruption or splitting, an element, by the way, sometimes worth considering in treatment of weak, broken-down teeth.

In Fig. 8 the teeth have been separated and the interior teeth consequently forced forward by just this defective arrangement; and although we find a very good articulation in other respects, in this we see an essential defect, which prevents the permanence of the position of the teeth.

This defect often occurs after early extraction of the first molars, or premature extraction of the deciduous teeth, for the bicuspids straggle into false positions, their cusps falling into the spaces (which are sometimes held open permanently), and usually by their entanglement preventing the normal motions of the jaws. (See Fig. 23.)

It has just been stated that Fig. 4 correctly represents the articulation upon one vertical plane; this plane corresponds with the curved line 2 of Fig. 9.

To understand these curved vertical planes and Fig. 9, place a piece of card-board flatly between the teeth of an articulated model, letting it extend out beyond the teeth, then draw a line from the incisors to the third molar, just touching the outside of the upper teeth, and the resulting line will be line No. 1 of Fig. 9. Another line drawn in the same fashion, only touching the outside of the lower teeth, will give line No. 2 of Fig. 9. Prick through the card-board and the relation of these lines will at once be seen. The next

line at the same distance, if the outside of the teeth were removed, would be line No. 3, which would pass through the bottom of the groove in the middle of the masticating surface of the upper molars and bicuspids, and through the outer cusps of lower molars and bicuspids and the cutting edges of lower incisors, as indicated in the diagram, and so on.

I have heretofore endeavored to show how the closed teeth should form one continuous self-supporting arch, "each jaw being," as Dr. Dwinelle once aptly remarked during the discussion of this subject, "a perfect matrix for the other;" yet in conversation with a number of eminent dentists since that paper appeared, I have not found one who grasped the idea of the cross or binding articulation of the teeth, especially the bicuspids, and the general impression is, that teeth ought to articulate as in Fig. 8, which has been already shown to be erroneous.

If I can make clear this one point of pure anatomy I shall feel that this paper has been of service to dentistry and mankind.

From the outside of any fairly well-arranged set of teeth, they can be seen as they appear in Fig. 4 (compare with Fig. 1, *C;* Fig. 21, *b;* Fig. 22, *a;* and Fig. 24, *a*); but look at it from the inside of a split model, and, if the articulation is good, the inner upper cusps do not shut into the spaces between the lower teeth and drive them apart, but instead, the cusp strikes into the depression of the next forward tooth, thus crossing over the space and binding the two lower teeth together. (See Fig. 1, *d*, and Fig. 22, *b*.)

If a vertical section were made on the line of the upper inner cusp, which is the same as line 4 of Fig. 9, the divisions of the teeth would appear as in Fig. 11, where we have the lower teeth bound together and prevented from being separated; but on this plane alone the tendency of the upper teeth would still be to separate, but another vertical section or view of the articulating line at 3 of Fig. 9—*i.e.*, through the points of the outer cusps of the lower teeth —would show the divisions of the teeth to be reversed (see Fig. 10), for here the upper teeth are permanently secured, while the lower teeth tend to separate.

It therefore follows that the two arches are mutually supporting, yet, without the split models it would hardly be suspected.

This crossing or binding of the articulation of the bicuspids (there is the same crossing in the molars) is most beautifully seen in the articulation of the teeth of anthropoid apes. (See Figs. 24, *a* and *b*.)

I have previously shown that the normally-arranged human teeth touch all around in both arches.

In order to be well articulated the teeth must be regularly placed and correctly inclined.

The most common irregularity of the teeth is the irregularity of the position of the masticating surfaces, and yet but little attention is given this matter in works upon irregularities, the attention being mostly confined to the deviations of the external curves or alignment of the teeth; yet if the former were attended to, the latter would necessarily be corrected, and more permanently so than is usually the case.

When teeth are regular and well articulated, they remain so because the forces and resistances are evenly balanced.

On the other hand, as the articulation is made up of a series of perfectly-balanced inclines, it follows that when anything removes one surface, whether an extraction, decay, operation, or badly-constructed regulating or other apparatus, undue force falls upon other inclines with the certain result of changing the position of the tooth or teeth.

I have hardly ever found what I could call a good articulation a few years after teeth had been extracted, and the same is true when the teeth have been cut away between, or when the cusps had been carelessly removed while finishing fillings in the grinding surfaces.

Such teeth antagonize but do not articulate, and cusps strike cusps, point to point (see Fig. 20), instead of passing between each other like cogs; and the motions of mastication are interfered with, especially the rotary, which is the essentially grinding motion, and hence the rapid wear of the limited number of antagonizing points goes on, as already spoken of.

Largely on account of bad articulation irregular teeth tend to become more irregular. Growth may improve some cases, but so far as a bad articulation goes it is always unfavorable to regularity of the teeth.

Much harm is done by the use of regulating appliances which change the articulation without improving it, and it is almost a universal fact that unless an improvement can be made in an articulation there will be no permanent improvement of the irregularity.

Finally, the articulation is the only permanent retainer to be depended upon.

The teeth will move till they find the best contact that circumstances can offer, and that movement often never ceases, because the forces never find equilibrium.

Before disturbing the articulation of a fixed irregularity, it is

best to consider whether such disturbance can be overcome, and the articulation again made as good; if not, the chances are that the result will be worse than the original condition, and for the ultimate result we must wait not only "till the teeth become firm," as we say, but until they cease to move.

There is much yet to learn in regard to the meaning of the elevations, depressions, overshutting, shelving, interlocking, binding, curves, and inclines of the articulation, in their relation to biting, cutting, tearing, crushing, and grinding movements of mastication.

In the treatment of our patients it is hoped that if we cannot all see our way clearly upon this matter, that we may at least see far enough not to make the articulations worse by our operations than they are when brought to us.

I will renew my endorsement, made before the International Dental Congress at Paris, of the use of Dr. Bonwill's articulator for the arrangement of artificial teeth. At the same time I also called attention to a paper by Mr. F. H. Balkwill, L.D.S., R.C.S., of Plymouth, England, but as the latter remarks have not appeared in any of the published reports, I again call attention to his remarkable paper, "On the Best Form and Arrangement of Artificial Teeth for Mastication," read in 1866, and published in 1868 by the Odontological Society of Great Britain, but only brought to my notice since the publication of my paper of 1887, before referred to.

OBSCURE PAINS IN AND ABOUT THE JAWS.[1]

BY J. E. GARRETSON, M.D., D.D.S., PHILADELPHIA.

Before reseating myself, gentlemen, you will undeniably be impressed that if your guest is offering anything worthy of acceptance on the part of the members of this Society, his own occasion is great for something to carry away. It is something, however, for one to know that he knows what he knows and to know that he does not know what he does not know. From the stand-point of this Confucian aphorism as designative of reliable knowledge, so far as it goes, I venture on a consideration of obscure pains in and about the jaws.

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[1] Read before the New York Odontological Society, October, 1891.

By obscure pains is meant pains the causes of which are more or less evident or not evident at all.

First. As to pain. What is pain? Abstractly it is to be assumed that all here will agree that it is altered sensation.

Second. If sensation is altered, the alteration is to be accepted as lying with a cause.

Third. Cause lying back of pain in every instance, the term obscure pain resolves itself into one of ignorance of cause.

Fourth. Obscurity being one with ignorance, the common term shows itself to be relative,—that is to say, the obscure to one is the open to some other one. There is another way of putting this in connection with the present occasion,—viz., it is not impossible, by reason of work done by members of this Society, that the term "obscure," as applied to pains in and about the jaws, from the stand-point of an individual's experience and knowledge, may, by reason of a putting together of heads, find to-day a complete revelation.

By reason of contracted outlook we lack in ability to read causes as these relate with variety. So we come to perceive that professional knowledge—and this is very encouraging to the young men, as well as to we older ones—is a matter of study and experience: finding out what others know; keeping up with the literature of our profession; taking advantage of opportunities to observe; learning something to-day which we did not know yesterday, and hoping to get something new to-morrow; and so if some case comes to us to-day that we cannot treat properly from lack of knowledge, to-morrow we may trust to find ourselves improved in that particular direction.

Pain existed in the time of Galen as in the present time. You recollect the saying attributed to him that "the cause of toothache is known alone to God." The Chinese are credited with the discovery of cause of this particular ache as lying with a worm, and deemed him ignorant who required other proof than was to be found in splitting a complaining grinder. Query, To what does the extreme modern bacteriologist attribute pain? Extremes meet.

Let our subject here find opening. Appreciation of the causes of pain finds understanding in diagnosis, as this lies with the processes of exclusion,—that is, putting it in other words, finding out what a thing is by first finding out what it is not.

Let me assume to say what I have to say as to searches made after diagnoses, as illustrated in procedure, which has become by reason of long usage a kind of second nature to me.

A patient entering my clinic or office is assumed as coming by reason of not being in a state of ease; not being in a state of ease, the condition is its converse,—viz., dis-ease. As students we long ago resolved this term.

The prefix "dis" expresses a converse happily and fully. If a man be not honest, we say he is dishonest; one not being in a state of comfort, he has been discomforted; not being able, he has been disabled. The ability to say what a "dis" is depends on education. Ask a laboring man on the street as to the cause of toothache, and he will not give you a very good answer. If you ask a young student, he may not give you a very good answer either. Men find themselves diagnosticians according to understanding, education, and acquirements. We are diagnosticians proportionately with employed opportunities. Diagnosis by exclusion lies with recognition of the existence of things pertaining to a circle around which the art of diagnosis is to move. Discrimination is with differentiation. A diagnostician is to know, for example, that a particular circle contains or embraces factors; let us assume a circle having twenty factors. The virtue of his art consists in saying correctly as to a particular factor out of a possible twenty related with this circle which may be at fault. It is the extreme of his art to be able to demonstrate that a *dis* lies with a twentieth undiscoverable cause in showing that it is not any other one or more of nineteen other causes or *dis*es, to the discrimination of which his knowledge is equal.

To make illustration. In the museum of our college at Philadelphia is the skull of a man who suffered untold agony from neuralgia affecting all the branches of the right trifacial nerve. No diagnosis was reached, nor was any one of a multitude of agents administered for his relief of the slightest service. Post-mortem examination revealed a spicula of bone growing from the border of the oval foramen and piercing the nerve. This case may well be set down as the twentieth cause of a circle to be considered,—a circle of jaw pains the first factor of which we shall assume to be a tooth decayed to an extent that exposes its pulp. The latter is simplicity itself; the former is identical with obscurity. To be able to know or to diagnosticate any pain in or about the jaws is one with knowing about all the possible factors. Who of us are so wise?

There are cases of obscure pain in the jaw regarding the origin of which we are entirely at a loss. We ask ourselves vainly as to the "dis." If the experience of the members of this Society is

akin with mine, they often find themselves compelled to wait a long while before finding out so simple a matter as that a supernumerary tooth is working itself down through a bone, and is worrying it.

Just before coming here, I had a peculiar case in a young gentleman sent from a distant State, who was suffering from a trouble situated about a tuberosity of the upper jaw. As I happened to cure him, I may explain that it was done by reason of a greater familiarity with a circle of possible causes than was possessed by a physician at whose hand he had been treated. I found on examination nothing particular out of the way in his jaw, except an undue broadening of the part complained of. It looked like an ordinary hypertrophy, not like a congestion. I made a cut through the swelling, finding what I had never met with before,—a supernumerary wisdom tooth.

Another case may be offered as being suggestive. Dr. Roberts, who, by the way, has died lately, had a conversation with another dentist, about a patient who was inferred to have cancer of the upper jaw. It was certainly a very ugly-looking jaw. It was in a softened, carious, broken-down condition, and the supposition seemed reasonable that the lesion was that of sarcoma. Examination impressed me that it was not unlike ordinary cases of sarcoma, as these are met with in clinical practice. After two or three visits I proceeded to scrape away the soft and offensive mass, and found situated in the nasal process of the maxillary bone a long eye-tooth. I took the tooth out, and the man got well in a few weeks. Not only the man in the street, but also some of our young friends, would have said, upon seeing such a jaw, "This is cancer." That is certainly what I thought on first looking at it.

I had a case recently, where a superior maxilla was seen to be very much enlarged externally; but when I looked into the mouth, I found the jaw edentulous, and yet in one of this man's antra I exposed five teeth.

Let us review or recall diagnostic signs as lying with pain itself.

We are to remember that, by reason of causes or conditions, pain varies from simple departure from ease to unbearable agony, and this not at all as significant of danger or the absence of it, but as expressions of location; example of the former is to be made by reference to pneumonitis, or, better, to Pyer's patches in typhoid; of the latter to pulpitis. All are familiar with the stitch in the side of pleurisy. To hear this last complaint from a person leads at once to the diagnosis of pleuritis. Acute and throbbing pains in

the region of cellular tissue points with certainty to a developing boil or carbuncle. Obtuse and heavy pain located about the liver or lung points to inflammation of these organs.

A bone inflammation is expressed in a sense of gnawing; a skin inflammation is located, even under one's unremoved clothing, by an itching combined with burning that is indicative of it; the conjunction of itching about the glans penis and stone in the bladder is familiar; coxalgia, as pointed out by pains at the knee; neuralgia, as differentiated from inflammatory pain by its sharp and lacerating and shock-like expression; throbbing, as denoting approach to suppuration, etc.

With these few but sufficient general premises as foundational, let us pass to the details of our subject as lying with the process of exclusion.

The first and most common cause of jaw pain is odontalgia; significant of,—

1. Exposure of tooth-pulp.
2. Peridentitis.
3. Sensitive dentine.
4. Confinement of gas or pus in a closed pulp-cavity.
5. The presence of granules of osteo-dentine in a pulp.
6. The recession and absorption of gums and alveolus.

These are familiar, every-day experiences, too common to need else than attention being called to them in a preliminary way. To these are to be added the pains of the dentitional period, etc.

Following these I would place syphilis of the tertiary form; undeveloped teeth: first, wisdom-teeth of lower jaws; second, supernumerary teeth; third, anomalous or unique growths.

Next, rachitic conditions in children: the discomfort lying here in a loose relation of the teeth with their sockets. Diagnosis is plain, relating as it does with a prevailing cachectic state.

I would place next, drawing on my own experience, pains in the mental region of the lower jaw that strike a patient suddenly, increase gradually, being soon seconded by a puffy inflammatory enlargement of the whole chin region, indicative of a free effusion of a plastic lymph, and which has its termination invariably in the loss of the teeth of the region by reason of exfoliation in the shape of sequestra of the alveolar process.

Next is to be placed a dull, heavy, demoralizing kind of pain, situated in the region of a cheek, where cause lies with closure of an artificial opening of an antrum, in which inflammatory change has destroyed the ciliated expression of the mucous lining of the

cavity, and where, consequently, the secretion lodges and remains upon the floor of the cavity.

I have had patients come to me from the distance of a thousand miles to consult, where the whole fault, if I may be pardoned for the suggestion, lay in the attempt of a dentist or physician to close a break in the antrum. I do not allude to those slight breaks that occur in extracting teeth, for such breaks close themselves. The condition referred to is where there has been a degenerative inflammation that has removed a portion of the floor by sequestration. Physiological changes in the mucous membrane have here occurred, which make closure of the break one with retention of the secretion. In my own practice, where an antrum has remained open some time, and where there has been a general inflammation about the part, I always advise keeping the break open.

Next, erysipelas. This specific inflammation, when appearing upon the face, expresses itself primarily as of deep origin. A person will complain of pain about the head and jaw, situated principally over the malar bone. The part is sore on pressure. You look into the mouth of the person, but see nothing. You wait a few hours, and now find a developing tension. Here is plainly shown a perversion of the circulation, indicative of inflammatory change. A little later the blush expressive of erysipelas is seen. I would like just here to throw out a suggestion to the effect that I have never known a case of local erysipelas that would not yield to a direct application of iron, quinine, and cinchona. A wide-thinking man may accept this specific, yet will not be deterred asking as to probable constitutional conditions. The prescription is as follows:

℞ Tinct. ferri chlor., ʒi ;
Quiniæ sulphatis, ʒi ;
Tinct. cinchonæ, ʒii. M.

The affected part is to be painted and repainted until the red blush disappears.

The means suggested is not an agreeable application ; it blackens the part. I have found from hospital experience that the ordinary benzoinated oxide of zinc ointment is a salve that may at times happily and efficiently replace it.

Next, malarial pain. Malarial pain finds expression, malaria being the "dis," in a lack of comfort about the teeth that is not easily described. The patient complains of an uneasy sensation in the organs. You find them perfect, perhaps, and are led to an inference of malarial relation through practise of the process of ex-

clusion. Taking, say, twenty possible causes, of which malaria is set down as the twentieth, and not finding the trouble related with any one of the nineteen other causes, one alone remains, namely, malaria.

Do we know certainly how many causes there are in the circle of jaw pain? No, we do not. So, sometimes we must feel our way by means of treatment. First, in a case of inferred malarial poisoning, as just referred to, the way is felt to an endorsement of our conclusion by putting a person on antimalarial treatment,—not big doses of quinine, because that is not always good. If any of you have lived in a malarial region, you know that accompanying the malaria there is a sense of depression and a sense of good-for-nothingness,—a patient not being absolutely sick,—certainly not reasonably well. I take the liberty to suggest in such connection a remedy which, when you are feeling your way for a diagnosis, may do some good in way of helping both you and the patient. I know of but few instances in which malaria has not yielded to this prescription,—

℞ Cinchonæ rubra pulv., ℥i;
Serpentariæ Virg., ℥ss. M.

To be put into one and a half pints of water, simmered into one pint, strained when cold, and one pint of Lisbon wine added. The dose is two tablespoonfuls three times a day; best taken just before meals.

Next, the so-called neuralgiæ. To say simply that one has neuralgia is, of course, but to repeat in English words the classic term.

The causes of so-called neuralgic pains are various; these being of local or systemic meaning. The most common seats of these pains are that of the supraorbital region, superficially, and of the line of the anterior portion of the superior longitudinal sinus deeply. The pains of these regions are commonly due to eye-strain. I had yesterday in my office a lady who has been suffering for a long time from such pain. There is such a continuance of discomfort that she has felt that life was not worth living. It was natural for me to look at her teeth. I found nothing the matter with them. Then I began to go around the circle, and, finally, I came to her eyes, discovering that she was myopic in the left eye to the extent of a sixth, and in the right eye to the extent of a fifth. I found something else, and this was perhaps of more importance than the first, —she had an insufficiency of the superior rectus muscle of the right eye, requiring a fifth prism for its correction, and similar insufficiency with the inferior rectus of the left eye. Take these conditions, and I think you will readily recognize how a person could be a continuous sufferer.

Once I had visit me a surgeon of the United States navy who had come from China to his home, under the impression that he had softening of the brain. He told me he had consulted many physicians who came into the Chinese waters without having any relief given him. The pain was continuous. I examined that man's mouth first, and found he had one of the most beautifully filled upper bicuspid teeth that I had ever seen. That was the only thing I could see in the way of a diagnosis. I extracted the tooth. The pain was gone quick as a wink. Think of the relief to that man!

Here, in the last two cases mentioned, are opposite aspects,—the one, muscular insufficiency; the other, an irritation of a branch of the fifth nerve. It does not imply, as to the first, that the pain came from a muscular radicle; it might have come from some distant part. I want only to impress that pain lies in cause, and that we should find ourselves able to expose cause, whatever or wherever it may be.

I could mention from my own experience a number of cases where insufficiency of the recti muscles has proved the cause of pain. Take a person, for instance, who focalizes well. He will take up a paper and read it perfectly. The accommodation is all right; but after reading any time, from ten minutes to two hours, the letters begin to blur and pain comes about the head. Almost always the trouble is found here to lie with muscular insufficiency. If such fault be corrected the pain is cured. Another thought is to be thus expressed: a man has long prided himself on having grand eyesight; take one of our own profession,—he has worked for years untiringly; finally, he operates for only half a day, and says, "I cannot work as I used to. I feel that the power is leaving me." His trouble lies, more than likely, in a presbyopic condition of his refractive apparatus. He needs a plus lens. Take a piece of ordinary window-glass and grind it down to a sixtieth convex, and his power is found to be in its old place. But if our colleague knows nothing about plus glasses, he goes on in a misconception of his condition that proves the destroyer of his usefulness.

Next, reference is to be made to pain located within the lower jaw, or external or internal to it. Inflammatory thickening of the inferior dental nerve always presents, as I incline to accept, a certain easily observable tumidity of the gum-tissues overlying the bone. This being seen of persistent character, the indication is for exposure of the nerve in its canal and its removal; but if the latter stages of secondary or the initial conditions of tertiary syphilis be

evident, or if rheumatism be present in other parts of the body, operative procedure will be wisely delayed until fair trial is given of the iodide of potassium.

Just here I have a personal experience to offer that I am sure is of large value. It relates with cases where removal of the inferior maxillary nerve has been practised in the canal, no benefit resulting, but where cure follows neurectomy done at the foramen ovale. Differences as to result exist here, with the fact that it is the mylo-hyoid branch that is involved. Again, full and complete neurectomy of the inferior maxillary nerve, unattended with cure of neuralgia, has satisfied me that the source of pain lies in the incisive branch of an opposite nerve that has passed beyond its ordinary line and is prolonged in its neighbor's canal. Pain confined to the mental region of one side finds explanation most frequently in a lesion existing at the mental foramen.

I think this matter about tumidity must certainly be new to some of you, for I have never seen it referred to in a book. A person comes to you with neuralgia in the lower jaw. You perhaps have had a great many cases of neuralgia of the lower jaw, and have not done much with them; but I think you will find that always where there is a thickening of the nerve-sheath, or where the lesion lies with the nerve-canal, there is always an external exhibit in tumidity. This is my individual experience. For myself, where I do not see such tumidity, I operate only in the faint hope of relieving a person, but I never do it with confidence; but where I see the tumidity, I treat with assurance. If one comes to you with a condition of neuralgia in the lower jaw, and if you find tumidity, and rheumatism as well, you may fairly think of the lesion as lying with the rheumatic condition, and endeavor to verify your diagnosis by antirheumatic treatment.

Neuralgia along the line of the temporal artery is always associated with the auriculo-temporal nerve. Its cause, if my experience be not unique, lies with exhaustion. It is a pain rare in men, but common to weak, over-worked store-girls. Indication is for rest and change. The sea-shore is the best place to send the patients. As a tonic, my individual experience favors the use of a formula as follows:

℞ Hydrarg. bichlor., gr. i;
Liq. arsenici chlor., ʒss;
Tinct. ferri chlor., ʒii;
Acid. hydrochlor. dilut., ʒi;
Syr. sarsaparillæ, ʒvii. M.

Dose.—Tablespoonful one-half hour after meals.

Section of the nerve, and removal of an inch, has never failed in my own hands to result in local relief.

Next, pain of neuralgic character located persistently about the region of the infraorbital foramen, like that of the mental locality is not unlikely to have as its cause a periosteal thickening of its membrane as it associates with the opening.

Section of the nerve in these cases is to be practised by removing the anterior wall of the antrum and making the division well back of the lesion. If the nerve be cut in front of the foramen, the result is transference of the expression of irritation to some other locality.

Next, pain about the bridge of the nose. This I am to infer out of my individual experience to associate with a lesion somewhere about the ophthalmic division of the trifacial. I think this pain is persistently defying. It is difficult, as a performance, to cut this first branch, which, as remembered, comes from the brain-case through the sphenoidal fissure, being in close relation with the optic nerve. I am satisfied that in every instance this neuralgia is expressive of a local lesion.

Next is the form of neuralgic pain that is unlocatable, being to-day in this bone or part, and to-morrow somewhere else. For myself, I am at a great loss here, save a lesion discovers itself plainly and openly. Cause may be constitutional or it may be local. An only thing to be done is to look, first, locally; second, systemically.

I had the case of a man whose suffering was so great that at night he would run around the streets of a village in which he lived, screaming with agony. I did seven operations for him; and one day he said, "Either cure or kill me." I said I did not know what to do for him save to take away his lower jaw. I took the bone away, and he has not had a twinge of pain since.

One of the most remarkable cases—a case you will see the obscurity of—was as follows: A gentleman came to me with a pain in the eye. He was another one who would shoot himself if he was not to be cured. I became much interested in him. He would come to my office, and, while describing his suffering, would suddenly jump up and crawl under the table, where he would scream from pain. I said to myself, "Effect and cause. Can I not, by great effort, by giving time, by spending myself on this man, discover the cause in which the effect exists, and by removing it cure him?" That man had searched for relief through the different cities of Europe. He had been in your city, where he had

been under the care of some of your best practitioners. He had been in hospitals without number without receiving any relief, all of which naturally increased an interest as to finding out, if possible, what was the matter with him. I went all around the circle I was talking about a little while back. But, going all around it, I did not find anything to explain the pain. I began to use atropia in the eye. I made a strong solution of it, but it seemed to have no more effect than if it had been put on a brick-bat. However, I kept on for weeks, and, finally, I did get the iris contracted, and I saw what seemed to be a little tumor coming to the edge of it. I said, "This is the cause," and I kept up the action of the mydriatic until I discovered a cysticercus. I watched this with great interest, not being disposed to show it until I was positive. One day I found it boring into the crystalline lens. I cured that man by removing the parasite, and he has had no twinge of pain in the part since.

We never have a condition of disease without there is the "dis," while our ability to discover the "dis" lies, as before suggested, in the experience had. Some of us direct our experience profoundly in one direction; some in another. That is one great beauty about professional fellowship. I go to one gentleman, who has given a great deal of attention to one class of troubles. I ask him to give me his opinion on a certain case; then he comes to me in turn and asks my opinion on something else, just as we are doing to-night.

I will not detain you longer, because we are here to be of use to one another, and it comes now my turn to listen to what others have to tell in the way of experiences.

A STUDY IN THE REGULATION OF TEETH.[1]

BY RODRIGUES OTTOLENGUI, M.D.S., NEW YORK.

Mr. President and Gentlemen,—Let us consider the position of a young graduate when the first case requiring regulation is presented to him. With no previous practical experience, can he rely upon the directions offered by text-books, and, by following them, feel assured of success? Unhesitatingly, I say, No! It

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[1] Read before the Odontological Society of Pennsylvania, November 14, 1891.

is my object in this paper to show wherein the descriptions of cases in published reports are inadequate to guide the non-expert.

It has been the custom of writers first to consider etiology. This is science, and therefore admirable from that stand-point, but only in a few instances does it assist the practitioner who is about to undertake a case. For instance, if it can be determined that a given disfigurement is hereditary, it is at once indicated that the retaining-plate must be worn for a long time. But the teeth must be regulated first, before a retainer is even to be considered.

Next, we find the author giving a general description of methods, all of which is invaluable, but does not yet indicate the specific plan best adaptable to the case in hand. Lastly, we come to cases from practice. This is the most valuable knowledge offered; but even this is inadequate, for we find the author explaining how he accomplished results, without giving in detail the obstacles which occurred unexpectedly, and how they were overcome by special apparatus invented by the ingenuity made requisite by the necessities of the condition.

Notwithstanding the fact that we have already so many text-books, I believe that there is room for one more, which shall be written as I mean to write this paper,—that is to say, after one or two very brief chapters upon generalities, and a reference to other works for the science of the subject, to proceed by a continuous history of numerous cases from practice, well illustrated, giving failures as well as successes, and placing in juxtaposition the accounts of cases apparently similar, which nevertheless demanded totally different methods.

Without further preamble I will describe the one case which I have brought with me, and which I have denominated a study. Last October a young woman, aged eighteen, came to me with her teeth as shown in the models. Just here let me say that the best set of models procurable are not always sufficient in diagnostication. This case is one of those where the study of models alone will not lead to the correct solution of the problem. Yet this was the very error into which I fell. Let us, then, consider the models a moment, and I will explain the deductions upon which I at first began work. At a casual glance it appears that only four teeth are involved in the irregularity. The superior central incisors are tipped inward, while the laterals project forward. This forward projection of the laterals is seen to be more apparent than real. Were the centrals in normal position, it would simply be one of a common class of cases where the anterior tips of the laterals

slightly overlap the centrals. The occlusion with the lower jaw being good, my first study of this case went no further than this; and I determined to begin by bringing the central incisors outward, after which the laterals could be slightly drawn back, and



the case considered completed. To do this a very simple appliance was needed,—a vulcanite plate to cover the roof, held in place by clasps, and having a gold hook about opposite the sixth-year molar on each side. Such a plate in position, a rubber band could be caught over one hook, brought forward between the lateral and cuspid, then back between the lateral and central, forward again between the next central and the lateral, and backward around the other lateral, being finally caught over the other hook. The tension would tend to draw in the laterals and throw out the centrals by one action. I made this plate before again seeing my patient, but I never used it. Why? Because further study showed that more was required in this case than the movement of four teeth. A closer scrutiny of the face showed that an otherwise comely countenance was really spoiled by a retreating chin, which was apparently augmented by the protrusion of the upper lip. This made a total change of plan expedient. In the first instance the alteration was to have been accomplished by considerable forward movement of the central incisors, and only a slight retreating of the laterals. By this plan I would have made no change in the upper lip, but rather the contrary, since I should have sent outward two more teeth to support it. If I wished to lessen the protrusion of the upper lip, it became necessary that the greatest movement should be in the lateral incisors which should be moved backward, and the centrals brought forward only far enough to

give them a more erect position. As to the retreating chin, that fact made an entirely new plan possible. It will be seen that in carrying the centrals forward, as first decided, there would then occur sufficient space for retreating the laterals. But if I were to undertake to bring the laterals backward first, there would be no room whatever for its accomplishment, all the teeth being present and closely contiguous. Space for this could be procured in either of two ways,—by extraction, a method reluctantly to be resolved upon, or by expansion of the arch. In this instance the occlusion would thus be destroyed, and sufficient expansion would leave the entire upper jaw, after regulation, biting outside of the lower, a sufficient cause, ordinarily, for not choosing it, submitting in preference to the loss of two teeth. With the disfigurement of a retreating chin, however, the case assumed a different aspect, for, after regulation of the superior jaw, the process known as jumping the bite would not only alter this defect in beauty but would restore a good occlusion. For these reasons the first method was abandoned, and widening of the arch was decided upon as a preliminary step.

Now, were I to follow the custom of authors, I could say here simply, a plate was made, supplied with a jack-screw, and the jaw was widened in so many days. The kind of plate and the jack-screw itself being well known, it might appear that I had said all that was necessary. I have seen various devices for widening an arch pictured and described, but I have never seen the difficulties of their application explained. Thus, when the young dentist confidently attempts to widen an arch with a jack-screw, he may be disgusted to find that he cannot do it. In my experience there have been very few cases where the jack-screw can be successfully used without special knowledge of how to overcome obstacles which will arise, or the ability to extricate one's self by ingenuity of invention. It may be advantageous, therefore, to say a few words about the jack-screw in connection with the plate.

Given a jaw not over fourteen years of age, in which the molars and bicuspids are well developed and of good size, standing in erect position so that their palatal sides are on parallel planes, the one side of the mouth with the other, and the widening of that jaw will be a pleasure. How often will such a condition be found in a mouth which is abnormal, since regulation is required? Any departure from these conditions adds to the difficulty of using the jack-screw and split-plate. The plate is made and allowed to cover the palatal surfaces of the posterior teeth for ever so slight a space,

and what do we find? A plate which has a bevelled edge to it. As soon as the jack is tightened the tendency will be to throw the plate down towards the masticating surfaces of the teeth. The jaw cannot be widened with such a fixture. The remedy is to carefully trim away the plate till it meets the teeth, presenting a sharp edge. But suppose that after this is done it is still found that the plate is thrown down. The reason will be that the palatal surfaces of the teeth present slanted planes. One way to obviate the slipping is to make a new plate having spurs of gold to extend between the teeth so that they will catch under the knuckle.

I made what I deemed would be a suitable plate for this case. It was of black rubber, supplied with clasps, and well-fitted, the edges being sharp. When placed in the mouth and the screw tightened, it was very firm. The first result of using a jack-screw is always gratifying. The measurement with a compass will show considerable movement within one or two days. After that, progress is slower. This is because at first the teeth move in their sockets, as when separating for filling. After a week my patient complained very much of pain produced by the plate along the palatal wall. Examination showed that the gum tissue had been destroyed till the bone itself was in sight. This was deplorable, but how had it occurred? The patient being eighteen years old, the teeth were somewhat resistant, but the main cause was the fact that upon that side the teeth tipped slightly towards the palate, so that the tendency of the plate, under the pressure exerted by the screw, was to slide up against the gum, thus making pressure against soft tissue, which, of course, yielded and was lost. This plate, therefore, it was necessary for me to abandon. I made a new one similar in every respect to the other, but in addition supplied with a means of preventing a recurrence of the disturbance. Taking a bit of gold wire and burning the ends till they balled up, I fashioned it so that it rested across the sulci of the first and second bicuspids. Another bit of wire soldered to this, forming a T, passed down and entered the vulcanite. Each side of the plate being supplied with a T, the arms of which rested in the sulci of the bicuspids, it is plain that the plate could not be forced upward against the soft tissue. This proved a successful scheme, and the jaw was widened without further difficulty.

Before the expansion was completed, a second plate was requisite, because the first one became too much straightened under the action of the screw. This second plate was exactly like the last described, except that in addition there was a gold hook opposite

the molar upon each side. As some space had been obtained by the widening which had been accomplished by the first plate, it was decided, when making the second fixture, to begin the retraction of the laterals. The plate in position, an elastic band was stretched from each hook over the lateral upon its own side.

At the end of the sixth week the jaw had become as wide as was deemed necessary. A comparison of the models will show that the asymmetry has been marvellously well corrected. It is also noteworthy that this patient is a gifted singer under the tutelage of one of the finest masters in the metropolis. Her lessons were necessarily interfered with during the regulating, which caused a deep growl of disapproval from the professor. After the regulation was completed this growl was changed into a song of praise, for the teacher asserts now that the added tongue-room has given the lady a richer tone, a better pitch, a more extended scale, and more control of her notes. Before passing from this I would say that the widening here gained in six weeks may seem inadequate to the time expended. It must be remembered that the patient was eighteen years of age. With children of twelve to fourteen I have seen a greater gain in two weeks, and in one instance but six days was required to widen a jaw the width of half a molar, more than which is rarely required. In that case the suture opened.

Returning to the case under consideration, we now come to the point where the plates for widening the arch were to be abandoned. The new fixture required was a simple plate to cover the roof of the mouth and fit accurately the palatal surfaces of the teeth. It was made stiff enough to resist the tendency of the jaw to resume its original form, and it was supplied with four hooks,—two opposite the molars as before, and two in the vicinity of the cuspids. A single rubber band was hooked to the posterior hooks and placed, as was intended in the first plate which I described and which was abandoned. To apply the band it was stretched across from hook to hook, and the plate placed in the mouth. Then a ligature was passed through one loop of the ligature, which was then brought forward till it rested over the four incisors. Next, the central part of the ligature was carried backward again and allowed to rest along the palatal surfaces of the centrals. The action would tend to force the centrals outward as well as bring in the laterals. But it was designed to reduce the laterals more, and therefore the other pair of hooks became necessary. A ligature was extended from each over the lateral on the opposite side of the mouth. With this the completion of the work was attained in two weeks more,

making eight weeks in all the time spent upon the case up to this point.

The next step was to make a retainer, and the one made is seen upon one of the models. I have seen it stated by one author that a "cage" can be made of piano wire in fifteen to thirty minutes which will fit accurately. It is possible that we do not all mean the same thing when we say that a fixture fits. I wish to call attention to the "fit" of this appliance. The model shown was made from a plaster impression taken with the fixture in place. Before pouring, the gold appliance was placed in the impression, and you see the result. I have not attempted to separate it from the model, because the backings for the two centrals were made to extend under the gum, and therefore are tightly held in the plaster. Besides, were it removable from the model, there would occur an abrasion of the plaster teeth which would soon mar the appearance of fitting. It is noticeable that, while this cage is accurately adapted at certain points, there are one or two places where the band does not rest against the teeth; but this is only at points where absolute fit was not needed. A retainer of this kind is very cleanly, being removable, does not fill up the mouth, and can be made to hold teeth rigidly in almost any position, provided the teeth are long enough, or of such shape that it may be fashioned so that it will keep its place. I will explain how this is made, for there is nearly ten hours' work in the construction of such a piece, at least in my hands. First, to an accurate model made from a plaster impression half round clasp-gold wire is bent into clasps for the molars and for the second bicuspids. These are perfected by fitting about the natural teeth, and made to bind the teeth near the gum-line. Impressions are taken with them in place, and models poured with plaster and sand. These models will present the clasps in desired relation to the teeth, and they are united with solder. This process is repeated, going to the mouth and taking new impressions as often as may be requisite till the cage is completed. Ordinarily there will be no need for a backing to any teeth such as I have for the centrals, a simple bearing of the band being sufficient. But while a band will restrain teeth which have been retracted, as it does the laterals in this case, it will often fail to control teeth which have been sent outward. This is because the palatal surface is an inclined plane, and the action of the tooth, in its tendency to return to its original position, will simply throw down the fixture. To make the backing, make an accurate model and then carve away the gum, exposing the bulb at the neck of the

tooth, carving it into shape. Make dies and swage the piece of pure gold plate. This will give an approximate fit, and the purity of the gold allows of its being readily burnished to the natural tooth, so that it is a perfect adaptation, extending below the gum and reaching a point of anchorage under the bulbous portion. The cage is then placed in the mouth binding the backing to place, and an impression and models made as before. Solder then unites the piece and stiffens the backing at the same time.

A fixture of this kind could only serve temporarily in this case, because it was planned to jump the bite. For this reason it would not have been made, except that the young lady wished to return to her home in Kansas for the Christmas holidays. She remained away for a month, and upon her return I made a plate with which to accomplish the jumping of the bite. This was a black rubber plate fitting accurately the back of the centrals, so that it should retain them, and supplied with an inclined plane, over which the lower teeth would be forced to reach. The laterals were controlled by a band around the labial surfaces. This biter was worn for four months, a longer term than is usually necessary. The habit being formed, a retainer was made which spanned the arch, two hooks passing outward over the posterior corners of the laterals, which were made to hold these teeth in their retracted positions. The final models show the result.

The points of special interest in this case are,—

First. It is one of a numerous class of irregularities, in which the best result is obtained after moving several teeth, notwithstanding the fact that the first study seems to show that but a few are involved in the irregularity.

Second. So simple a thing as the widening of the arch could only be attained by devising means of overcoming an unexpected difficulty in the abrasion of the soft tissue of the roof.

Third. So universal a retainer as the one shown could only serve a temporary purpose, because of the closeness of the occlusion.

Fourth. The unusual advisability of destroying a good occlusion and reconstructing it, because of the gain in facial symmetry and the advantages of voice-power obtained by slightly increased width of the arch. It is a question of some interest whether the improvement in singing was due to increase of tongue-room or to the improved curve of the arch.

Fifth. The length of time required to jump the bite, occasioned by the fact that either the age or the intense habit made the patient so reluctant that the inclined plane tended to throw the lower

incisors outward rather than to alter the swing of the jaw. This spreading of the laterals made it necessary to abandon the inclined plane from time to time that the teeth might return to normal position.

Sixth. The beautiful result, which has repaid all the thought and work expended upon the case.

SOME THOUGHTS UPON PERSONAL DENTAL EDUCATION.[1]

BY W. MITCHELL, D.D.S., LONDON, ENGLAND.

Mr. President and Gentlemen,—I must confess it is with some trepidation that I undertake to write and speak upon a subject that has been discussed and written upon so often, and which has absorbed so much of the attention of the greatest minds of our profession, but still remains as one that must ever lie closest to our conscience; for it is always presenting new phases, as it must necessarily do, being inseparable from a profession that is from its very nature progressive and adaptive; searching here for the cause of phenomena exhibited in as many different ways as there are controlling or modifying influences, or there delving into the mysteries of scientific investigation for the solution of problems that are hidden from us by a coyness that nature alone possesses, and of which she only divests herself after the most persistent importuning on the part of the earnest searcher after truth.

That we are living in an age in which mediocrity has only to be seen to be as readily recognized is a fact that will admit of but little argument, yet there still remains an abundance of it in all professional life, and I think I may safely say, without fear of being refuted, that there is as much to-day in our chosen profession as in any other; deplorable fact that it is, we must face it as it stands, though it is not as we should wish it to be.

Recognizing and appreciating the fact that all effects are the result of causes, either contributory or predisposing, let us look about us, and, if possible, detect the cause for the following effects,—viz., difficulties attending a popular dental education, and lack of stability in the idea of young practitioners.

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[1] Read before the American Dental Society of Europe, at Heidelberg, August 5, 1891.

The foregoing propositions may be considered separately; but from the very nature of the subject they are so intimately blended that it is impossible to draw a distinct line of demarcation; so intimately do productive causes blend that it is almost forced upon us to go back of the beginning.

There being but two sources of knowledge,—personal and acquired,—it is easy to see that we, as public educators, must be so thoroughly impressed with the responsibility of our position that no operation should be performed, or word uttered, but that carries with it the stamp of reflection, deliberation, and truth; with these ideas as the basis of our creed, there need be but little fear of our occupying the position the most zealous workers of our profession so arduously toil for.

Can we hope for a popular dental education while so many of the profession remain in ignorance? No! certainly not! Let us then break down the barrier that has ever existed to bar the way of progress in every clime and age. But there we are confronted with the question, How are we going to do it? Were it not for the inspiring and friendly light of our societies, whose lamps are kept trimmed and burning by the vigilance and self-sacrifice of those whose life's work has been in the interests of their cherished calling, I must admit the question would be difficult of solution.

To be able to instruct others, we must of necessity possess the knowledge we wish to impart, and also have the ability to demonstrate or didactically convey our ideas of the lesson we wish our pupils or patients to learn.

This brings us to the consideration of our sources of information. We owe it to ourselves, the profession, and the public that a correct system of practice be studied, and a taste cultivated for keeping fully abreast with the times, and a desire to be thoroughly acquainted with all advanced methods, research, and discovery in the closely-allied sciences of dentistry and medicine; being careful to thoroughly scrutinize from different points of observation all alleged facts, and after submitting them to the crucial test of practical application, then, if not found wanting, we can enshrine them in our professional repository and cherish them as gems of the fairest type.

Here, then, is the opportunity of analyzing our own capacity for the performance of a public duty which at some time or another falls to the lot of us all,—*i.e.*, the selection and education of our pupils; there are very few of us here who have not had some experience in this direction, and in the light of that experience, we do

not see where we could have improved upon the selection, as well as upon our exactions as to the *régime* through which our pupils have had to pass during their preliminary training with us?

In many cases too little discrimination is painfully evident in the selection of the material for the coming dentist, this being supplemented by a rule of thumb pupilage, a superficial appreciation of fundamental principles is engendered which reflects unfavorably upon the early training of our prospective successors, and promotes a careless consideration of scientific subjects and data that goes far towards curtailing the value of many statements we hear made at our professional gatherings.

To quite an extent the remedy for this evil is in our own hands, did we but recognize the necessity for accepting as pupils only those who possess the natural qualifications for the study and practice of dentistry; and right here I would like to add that dentistry requires the greatest capacity for developing resource, and the ability to grasp the situation, and quickly apply correct principles, and make them subservient to the desired end in a more marked degree, than does any calling with which I am acquainted.

Our offices should not be made an asylum for any one who may be desirous of entering a profession simply because their parents or guardians are able to pay a premium and furnish the necessary funds to complete their prescribed collegiate career, for this in many instances proves the easiest way of finding them partial employment for a few years, and curtailing their opportunities for getting into mischief; it is this class that greatly contributes towards furnishing the dismal failures we so often see and hear of, and at the same time, by reflection, minimizes the well-meant efforts of our most earnest workers.

If the foregoing be true, then we must look at home for at least a partial remedy of this reproach, and, by a more judicious selection of pupils, weed out as far as possible this undesirable element of danger.

It seems to me, of late, too many of those to whom the young practitioner should look for inspiration and advice are astride that nondescript hobby which, to themselves, must have proved as great a farce as did a certain woolly specimen of the genus equina, and which has played the *rôle* of a misplaced switch in the lives of those who, having started out on a career of probable success and usefulness, and only lacking the years of experience which would have developed the positive element of their natures, thus resulting in outspoken, uncompromising champions of truth and the right,

have hopelessly wrecked their prospects through the allurements of these mental acrobats.

In the medical profession we have the various schools represented, each one practising according to his belief in the tenets of his school, and accepted in the community in which he labors as a representative of said school. How different it is with our profession! looked upon in most communities as a calling composed of semi-professional mechanics, governed by but few well-defined lines of procedure, and whose success depends chiefly upon their ability to draw upon their natural resources, and when these are taxed to their utmost—as they not infrequently are—the results are only considered as coming from a "dentist."

The reason for this probably arises principally from two causes: First, our profession being practically in its infancy,—as compared with other branches of the healing art,—it can hardly lay claim to the time-honored dignity with which its compeer is favored; but if its subsequent progress is at all proportionate to its past history, it is destined to stand without a peer in the grand galaxy of science and art whose field is that of ameliorating human suffering. Secondly, the public have heretofore had such a peculiar practical experience with so-called dentistry, it is but reasonable to suppose they would look askance at any proposition that may now be made by our profession advancing its claims for recognition by them.

American dentists in Europe are continually having the status of American dental colleges hurled at them by the so-called professional literature of this side, and the value of their degrees questioned and ridiculed. American dental colleges like almost all other earthly institutions are open to improvement, and I have no doubt but their progressive superiority will be demonstrated in the future, as it has undoubtedly been in the past, continuing to furnish the pattern that is so poorly copied on this side, and which I am sorry to say at present is more of a cheap burlesque than a worthy replica; and while ridicule and poverty-stricken wit has taken the place of argument and logic in the European press, the fact remains that more bogus diplomas are held and more questionable means resorted to to obtain legitimate degrees by men on this side of the Atlantic than upon the other, and had it not been for the European market these diploma mills would have died a natural death.

As an item for the consideration of those whose cheap sneer is the only compliment they have at their disposal for the dental colleges of the United States, I would propound the following question: Why is it that the best and most progressive students, after

completing their course on this side and having learned all their instructors were capable of imparting to them here, seek the halls of learning in America to secure that which they were unable to obtain here, where the best obtainable is supposed to be within easy reach?

And why is it, if American colleges are as superficial as they are said to be, their alumni hold the positions in the European capitals they do? I am constrained to believe we shall have to wait some time for a reply, the enforced silence of the press upon these points clearly endorsing public opinion as to the merits of the respective institutions and their representatives.

While enjoying the proud distinction and privilege of representing here the various institutions of dental education in America, we must exact of them the necessity of an advanced curriculum and technique, and the cultivation and promotion of a keener appreciation of professional dignity than that hitherto enjoyed by the average dental student; the building up of his professional career upon this basis will do much towards eliminating from our calling what has heretofore been a great element of weakness.

With all the restrictions surrounding the practice of dentistry in Europe, it is to America that the public on this side must look for the best exponents of our science and art, and, speaking more specifically of England, the supply hardly equals the demand, as there seems to be a decrease of active practitioners, and the number of registered pupils insufficient to fill deserted ranks.

While only having just touched upon some points where advance may be made as to our obligations in connection with the pupil question, and without suggesting an arbitrary remedy for the many evils that may exist in its present condition, and which will admit of much personal reflection and consideration, I will pass on to the brief consideration of the second proposition. The lack of stability in the ideas of young practitioners, I believe, is partly accounted for by some of the before-mentioned influences, supplemented by the off-hand utterances and vacillation of many of our older practitioners who frequently, to please some one else, blow both hot and cold, and make remarks that are allowed to pass unchallenged when they are known to be erroneous, or capable of very great modification, according to the existence or non-existence of certain circumstances.

If the recruits of our ranks were to indulge in the highly beneficial mental exercise of reasoning from cause to effect, and *vice versa*, a capacity for analysis would be promoted that would very

materially assist them in readily detecting flatulent verbosity from well-evolved ideas, and assembling to their own advantage the essence of the subject under consideration, and discarding the almost impenetrable husk with which many good ideas are too frequently covered.

There are two studies that could be pursued to advantage by the average man, and would do much to wean him of the habit of making the random statements we so often hear; these are chemistry and metallurgy; and, strange to say, while these studies are embodied in all dental curriculi, how much time is devoted to the careful consideration of either? Both being dismissed in the most superficial manner; yet, being *exact* sciences, their importance from that stand-point alone would at once suggest the necessity of their thorough consideration.

This suggests to me the question, Where are the chemists of our profession? The reply is conspicuous by their absence; and while it remained for our profession to develop the possibilities of ether and nitrous oxide gas, it was not dentists who discovered either agent. The theorists and experimenters of our profession are rarely practical with their ideas, but very like statisticians looking for something, and, by a careful manipulation of methods or figures, find what they look for. And this not infrequently passes for scientific research, and correspondingly misleads any one whom a practical experience has not taught better. Hence the necessity of keeping an open and unbiased mind, one free and unprejudiced, weighing in the scale of private practice the problematical commodities so lavishly thrust upon us by men whose scientific capacity is often in the inverse ratio to their sublime self-assurance.

Let us, therefore, be guarded in our statements, and do not let us send forth as an axiom an idea that is based upon a single success, but let its value be proved by repeated exactions under different circumstances; let us be more accurate and thorough in the tabulation of cases; let us talk a little more of our failures, and trust our successes to take care of themselves, for some brother may be able to pilot us past the rock that stranded our initial effort, and help bring order out of chaos, and thereby assist us to round out our sphere of usefulness, and thus promote our highest ambition to be the greatest good to the greatest number.

DENTAL MEDICINE.[1]

BY R. M. CHASE, D.D.S., M.D.

When invited by your committee to read a paper on dental medicine, I had hoped to find time to give, at least, a partial *résumé* of the many valuable drugs which the dental practitioner might call to his aid to alleviate human suffering, and by their means evoke a general discussion upon a subject which, to my mind, is sadly omitted in most dental conventions. While it is too large to be encompassed in one paper, or discussed in one session, my sole object is to speak of some of the later therapeutic agents which we, as specialists, may judiciously use to keep pace with others in general medicine and surgery.

Antiseptics I will place first on the list, as I believe you will bear me out when I make the assertion that those are first in importance to the dental practitioner, for without antisepsis no dentist can conscientiously practise his chosen profession. How to use, what to use, and when to use antiseptics in dentistry is a field large enough to occupy in discussion a whole session; hence I will give only a few of the large groups of agents which one may choose from, notably, carbolic acid, creosote, salicylic acid, eucalyptus oil, iodoform, bichloride of mercury, peroxide of hydrogen, benzoic acid, boracic acid, aristol, bromine, phenol sodique, campho-phenique, chloro-phenique, listerine, and Dr. Seiler's[2] antiseptic tablets, etc.

Nearly all of these, when brought into contact with disease-germs, destroy their vitality by arresting fermentative processes and preventing the decomposition of organic substances.

Hence it is our duty to select such as are more pleasant to use, antiseptic qualities being equal.

There are several elegant preparations in the market which, from their composition, are worthy of more than passing notice. Among these are listerine, campho- and bromo-phenique, hydrogen peroxide, etc. Listerine probably possesses a wider range of usefulness for the dentist than any one preparation, for, in fact, it may enter with propriety into nearly all prescriptions which the dentist may be called upon to write. As its composition is no secret, the practitioner is justified in prescribing it.

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[1] Read before the New England Dental Society, October 29, 1891.

[2] *Medical Record*, February 18, 1888.

Tablets made from Dr. Seiler's formula are much handier, and I find them as effective, prescribed in proportion of one tablet to two ounces of water. This makes a convenient form of dispensing to the patient, and does away with bottles. For a mouth-wash, for ill-conditions of the oral cavities, it is unsurpassed. After extraction it prevents subsequent pain and soreness, and there is hardly a day passes that I do not prescribe it in some form. I prefer it on account of its agreeable qualities to phenol sodique, which was once a much-lauded and very good preparation, rightly used.

Campho-phenique, composed of fifty-one parts carbolic acid and forty-nine parts camphor gum, is a very elegant preparation for raw surfaces, pulp-canals, pyorrhœa alveolaris, and for exposed pulps before capping. Bromo-phenique I have used with good results in devitalized teeth when abscessed. The listerine, or antiseptic tablets, I use to clean my instruments, for the reason that it does not discolor as in the case with bichloride of mercury. If any of you present have not used listerine, I would recommend you to obtain literature upon it, which will give you a better idea than I can in a limited talk like this.

Peroxide of hydrogen still stands at the head as an antiseptic, and undoubtedly is one of the best agents yet discovered to annihilate germs.

Charles Marchand's preparation (H_2O_2) is, I believe, the best article in the market, as peroxide of hydrogen is very susceptible to certain conditions. To get good results, it should be kept in a cool place, well stoppered, and, when required for use, as much as desired should be poured from a large bottle into a small receptacle, and only what is to be used should be exposed to the light. When small cavities are to be cleansed, it should be injected with a small glass or rubber syringe, as metal should not be brought in contact with it, as it quickly destroys its utility. For reaching pulp-canals I find a small glass medicine-dropper very convenient, as by pressing upon the rubber bulb quickly it is forcibly ejected into the pulp-canal without much trouble. I used a wooden tooth-pick, reduced in size, to still further push it into the root. In treating all ill-conditions of the oral cavity, I make it a rule to first rinse thoroughly the mouth with dilute peroxide, and then apply remedies suitable for the same.

Aristol is a combination of iodine and thymol, manufactured by Friedrich Bayer & Co., Elberfeld, Germany. It is a valuable, inodorous, and non-toxic antiseptic remedy, much superior to iodoform, iodol, and sozo-iodol.

Aristol is insoluble in water and glycerin, slightly soluble in alcohol, readily so in ether and oil by the aid of friction. It is not absorbed into the economy, and is consequently non-toxic, in which respect it has the advantage over iodoform. It is a good germicide, and less irritating than most antiseptics. Its use in pulp-canals is especially indicated when there is considerable odor, as in case of a recently-decomposed pulp. It may be used either in powder or solution. The most important use I make of it is in combination with chloro-percha as a permanent root-filling, thus rendering the gutta-percha usually permanently antiseptic. Two grains of aristol powder incorporated into a drachm vial of the chloro-percha will suffice. If the aristol precipitates by standing, it should be well stirred together before using. While I do not claim that this is a specific for all trains of symptoms following the wake of devitalized or abscessed teeth, I do know that in my hands it comes nearest to an ideal root-filling of anything I have ever used. To illustrate: A lady came to me several months ago, anæmic and delicate, with a left superior second bicuspid, with the crown nearly all amalgam, with a vent hole near the gum on the buccal surface, which had been left open for several years. I advised her to have the root treated, filled, and a crown inserted. She looked up to me in surprise, and said, "I have been to several dentists, and they said they did not dare to stop up the root." I informed her that I was willing to undertake the operation, and did so. I proceeded to treat the tooth in the usual manner, after which I filled with aristol chloro-percha without the least irritation following.

I could cite many similar cases, also abscessed teeth, with like happy results.

Much more could be said, and undoubtedly will be brought out in this discussion, upon this and other valuable antiseptics. The other older antiseptics are too familiar to all to take up for discussion. Whatever is used, if it accomplishes asepsia, you have gained all that the best surgeons in the world can, and much may be added to our success in this direction as practitioners of dentistry.

Disinfectants and deodorizers are so closely allied to antiseptics that I will not arrange them separately, as most agents of these classes, with few exceptions, possess virtues in common with each other.

Before closing, you will pardon me if I refer briefly to a class of remedies which are held in high esteem by the general practitioner of medicine, and, while comparatively new, are fast superseding prescriptions of the past for the relief of many painful con-

ditions which the dentist in his daily routine of practice is justified in treating.

Acetanilide (antifebrin) is a pure white and crystalline powder of neutral reaction, but of a slight burning taste. Acetanilide is a very efficient antipyretic, besides being strongly analgesic and antispasmodic. The two latter we, as dentists, are especially interested in. Its anodyne effect upon neuralgia of the fifth pair of nerves is often magical. For headache, after a protracted dental operation, it is especially useful. I usually give a patient a five-grain dose, either in a powder or in a more convenient form, compressed tablets, to be repeated every two hours until relieved. Not over thirty grains should be given in twenty-four hours. Usually one dose is sufficient for an ordinary headache. For a severe case of neuralgia several doses may be given, until the desired relief is obtained. I consider this superior, at the same time handier to prescribe, than gelsemium, aconite, etc., which have commonly been used for this troublesome affection.

Salol (salicylate of phenol), as its name implies, is of the phenol family, and is another valuable remedy for neuralgia, consisting of sixty parts by weight of salicylic acid and forty of carbolic acid, is insoluble in water, almost tasteless, and odorless. Dose, five to ten grains, once in two hours, until three or four doses have been taken.

Antikamnia, meaning "opposed to pain," is a new analgesic, antipyretic and anodyne, furnished by the Antikamnia Chemical Company of St. Louis, and is valuable in neuralgia and other allied disorders. It relieves pain and has no after-effect, causing no excitation of the heart or cyanosis. Dose, three to ten grains, followed by a swallow of water. This remedy may be used in all cases as a substitute for morphia, without the after-effects of opiates. It can safely be exhibited, being given in from twenty-four to sixty grains during twenty-four hours.

Sulphonal is a very popular, prompt, safe, and reliable hypnotic, which, in proper doses, produces quite natural sleep. This valuable remedy may be best given when patients suffer from persistent neuralgia, in doses from ten to thirty grains. This remedy has not the ill effects of morphine, and the dose need not be increased by long-continued use. I believe that it is one of the best hypnotics that we possess. Sulphonal is best administered at supper-time, dissolved in hot liquids; usually a cup of tea makes a good vehicle. It may be obtained in tablets of five and fifteen grains, which make a very convenient way of prescribing. It is unquestionably the best article that we have to prescribe to a nervous patient after a pro-

tracted operation in the chair, as a small dose will give them a quiet, peaceful night's rest.

Phenacetin is another valuable analgesic which the dental practitioner may call to his aid. I have had good results in administering it in five-grain doses, once in one hour, until fifteen to twenty grains have been given. This seems to control neuralgia and headache when other remedies fail. While some administer it as an analgesic in single doses of fifteen or twenty grains, I have not had occasion to use such large doses to control my cases. It is absolutely tasteless, and more agreeable to take than any other antipyretic, and without the toxic effects which are claimed of some of the other preparations of this class.

With these few remarks I will close, trusting that the remedies which I have noted will, at least, serve to start a discussion which will undoubtedly bring out many other articles in *materia medica*, which will be of inestimable worth to us as practitioners of dental surgery.

ETHICAL ENVIRONMENTS OF THE DENTAL SURGEON.[1]

BY ALBERT WESTLAKE, D.D.S.

While listening to the eloquent discussion on "Dentistry of the Present Day," and kindred topics, at the June meeting of the Central Dental Association of New Jersey, I recalled the substance of a report which I once read in an old English medical journal of a meeting in 1844 of the Royal College of Surgeons.

The chief point of contention was the question, whether the future dentist should be a member of the College of Surgeons?

It was well known that the examiners of the college never put questions that had any relation whatever to dental surgery.

It was contended that the best dentists were not "qualified" men, and that as "drawing teeth" was a mere mechanical operation, a blacksmith was as good a dentist as a surgeon. In fact, one of the prominent surgeons present declared that a dentist with whom he was acquainted had been originally of that calling, and the learned doctor considered that his early education rendered him *more eligible as a dentist than though he had been educated as a surgeon!*

[1] Read before the Central Dental Association of Northern New Jersey, December, 1890.

Could our learned doctor of England have been transported over three thousand miles, and the past thirty-five years, his intellectual armor would need finer temper than could have been welded by his "blacksmith dentist" to have withstood the brave onslaught made by Doctors Atkinson, Stockton, Dwinelle, Bonwill, and others, on the obsolete practices of some of the doctors of medicine in the domain of dental surgeons.

It is often demonstrated to the members of the dental profession that there are yet doctors of medicine and surgery who,—

> "Perch'd near *Science*' top,
> Sit only watchful with their heavy wings
> To cuff down new-fledged *talents* that would rise
> To nobler heights, and make the groove harmonious."

It may be said that there is a natural tendency in man's mind to bow to intellectual authority, and there are many to whom intellectual slavery is natural and easy.

A distinguished prelate once remarked that "Authority is the greatest and most irreconcilable enemy to truth and argument that this world ever furnished. All the sophistry, all the color of plausibility, all the argument and cunning of the subtlest disputers in the world, may be laid open and turned to the advantage of that very truth which they designed to hide or to depress, but against authority there is no defence. It was authority that would have prevented all reformation where it is, and which put a barrier against where it is not."

The day of "systems" has practically passed. The love of truth for its own sake and devotion to independent inquiry has placed the dental surgeons to-day where the medical profession, as a whole, is forced to recognize their discoveries and deductions.

This brings us to the "code of ethics," a subject that will be discussed more in the future than it has been in the past.

In years gone by, when one's knowledge was wrapped up in his anatomical frame-work and the four walls of his office, the ethical shoe pinched only when a secret was out. Petty jealousy of the superior reputation or worldly success of another is below the high principles of the nicest honor which should be expected of members of a noble calling.

To-day the door is wide open, and he can pass up and possess the Beulah land of knowledge who spares no toil, who shrinks at no sacrifice of ease or momentary enjoyment, who feels elevated at the grandeur of the end at which he aims, and by his very energy

spurns away difficulties which otherwise must thwart and overcome him.

We are in a profession which, like that of medicine, while it summons into active play the strongest powers of the understanding, tends to foster the kindliest feelings of the heart. This is nominally true as regards our painful surgical operations and intercourse with our patients, and it should be so in the field of fraternal fellowships. That our medical brethren are accepting our right of position in the "sphere" of professional life is perforce conclusive.

Those dental surgeons whose practice is confined to the towns and smaller places (and some cities) are often reminded of the vagaries of surgical knowledge. In June a young man, aged twenty-five, came to consult me in regard to a swelling near the angle of the inferior maxilla. He said that Dr. X. (an M.D.) had prescribed an ointment to be rubbed on the affected surface for three days. Finding no improvement, he came to me. On examination, I found an *impacted* "wisdom tooth." Being unable to reach it in the ordinary way, owing to the tension of the muscles, I was obliged to sacrifice the twelfth-year molar, and then reaching with a straight incisor forceps, worked the offending third molar out. The simple remedy of removing the cause to effect a cure.

Case II.—Miss F., aged approximately twenty-five, came to me about ten months ago, and said that her physician, after one year of treatment, advised her to go to a foreign sanitarium, as she had "heart-disease." Before leaving she desired to have a tooth extracted that annoyed her. Upon looking into her mouth the remark made by one of our college professors, that "ninety per cent. of the so-called cases of heart-disease are due to indigestion," came to me. The statement is broad, but at times valuable from which to make deductions.

I suggested that she should postpone her trip until I could extract *all* the roots on the superior arch, there not being a sound tooth there, and the surrounding tissue being greatly congested. She consented. After extracting, I sprayed a four-per-cent. solution of cocaine, and, dissecting the gums, excised *the alveolus;* then cutting off the ragged edges of gum, I dismissed her with a regimen.

In three weeks I had the temporary case inserted, and to-day not only has the "heavy feeling," as she described it, and the palpitation of heart, after eating, disappeared, but she has gained eighteen pounds in weight.

Case III.—Lad, aged ten years, complained of pain in the ear; was treated constitutionally by a medical doctor for a week, at the

end of which time a swelling appeared under the left eye. The surface was actually poulticed by the physician's direction, and when he deemed the case "ripe" he applied the knife. The pain continuing, the parents brought the child to my office. I found that although the sixth-year molar had apparently been extracted, yet there was indication of a root remaining. By probing I located the root, which had evidently punctured the floor of the antrum. Using a broken-pointed excavator, I succeeded in bringing the offender out.

Enlarging the opening, I washed the parts thoroughly with a warm solution of chloride of sodium. The odor being offensive, I injected diluted permanganate of potash, then full strength peroxide of hydrogen, and at later sittings hydronaphthol and aromatic sulphuric acid, and can report the case cured. I found small portions of necrosed bone, which I removed with suitable trephines. The sight of the left eye was impaired by the floor of the orbit being raised and the optic nerve stretched, and the nose was swollen, all of which plainly indicated abscess of antrum.

Case IV.—Miss B. had seven gold fillings inserted in the spring of 1890, and I dismissed her with the assurance that her teeth were in good condition. No apparent indication of caries in any of them. Returned, after absence of six months, with proximal and fissure cavities in five teeth, and others considerably corroded. On inquiry, learned that she had been under a physician's care for general debility, and had been taking tincture of iron. After again putting her teeth in order I called upon her physician and inquired if he administered the tincture to secure local effect on the throat, the patient being subject to ulcerated sore throat; he said, "No."

"Then why don't you give the remedy in capsules, or ferrum dialysatum in Vichy water through a tube?"

"Oh! I guess what I give won't injure the teeth, and if it does, 'tis good for your business."

Another case was where the same medical doctor was implicated. A young woman called, suffering with an alveolar abscess. Her friends insisted that she call to see me, although her physician had advised her to take some remedies which he gave her and to wait until the swelling had decreased before she had the tooth extracted. I told her in as simple a manner as was demanded that to secure the contents of a bottle we must either remove the cork or, by a slower method, make a hole through it. She finally understood the parable and application and was relieved. She belonged to that class who tell you that her grandfather's teeth were all double and "he finally shook them all out."

The cases cited above are typical ones, and doubtless occur in every-day practice of many dental surgeons; but I have one that is, I think, new, yet it illustrates the idiosyncrasies of some practitioners.

A lady called upon me and said that her physician (a Homœopathist) requested that she should have all the amalgam fillings in her teeth removed and gold inserted, as "the mercury in the filling was injurious and it did not allow his medicine to act."

I found the fillings were evidently put there by an operator who had conscience and skill, and I told her it would be better to go back to catnip tea or a "lower dilutionist" than to disturb such good work.

I only cite these cases to make the point that the medical profession must recognize the fact that they have no more warrant to trespass on our specialty of oral surgery than has the dental surgeon in obstetrics. "Render unto Cæsar that which is Cæsar's." One of the vital considerations of the day, within the power of the family physician to control, is the importance of having the mouth and teeth of pregnant women kept in healthy condition. How much suffering could be prevented to the mother, and what possibilities of amiable temperaments in the offspring, if, when the family physician is cognizant of the pregnancy of the woman, he should advise and insist that she engage the services of a competent dental surgeon. Some high-minded and sympathetic practitioners do anticipate the comfort of their charges in this respect, and refer them to those dental surgeons whose skill and tender manipulations relieve the tension of their patient's hypersensitive nerves.

In this and many other ways the public will be brought to a more intelligent understanding of the scope of our profession. There is power in a name under some circumstances. I love to hear the changes rung on the words dental surgeon. I believe the day will come when the current pseudonyme *dentist* will be applied only to the empirical.

The members of the dental profession are rapidly coming under the canopy of fraternal fellowship, from which we can go forth into the sunshine of knowledge that is now on the rise, and, keeping our intellectual pores open, absorb the unfolding mysteries of physiological chemistry and surgery as applied to our exigencies.

Reports of Society Meetings.

NEW YORK ODONTOLOGICAL SOCIETY.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, October 20, 1891, at the New York Academy of Medicine, No. 17 West Forty-third Street.

The President, Dr. William H. Dwinelle, in the chair.

REPORT OF THE RESOLUTION COMMITTEE ON THE DEATH OF DR. JAMES W. WHITE.

The New York Odontological Society learned with painful surprise of the sudden death of Dr. James W. White, of Philadelphia.

Although not a member of this Society, Dr. White has frequently been present with us at our meetings and social gatherings, and his genial face and pleasant voice have left indelible impressions upon the minds of us all. He was a tireless worker; and his literary labors for the advancement of dental science and art have made his name familiar to members of our specialty the world over.

In his native city he was repeatedly honored with positions of trust, which he filled with ability; and his integrity was never questioned. He was recognized and esteemed by his fellow-citizens as a public-spirited man.

The death of such an individual is not only a loss to his family circle, his numerous friends, and to our specialty, but is a public bereavement.

The Odontological Society deplores the departure of this distinguished friend and popular journalist, and its individual members unite in expressions of sympathy for the family and friends of our departed brother.

C. E. FRANCIS.
A. L. NORTHROP.
BENJAMIN LORD.

The report was accepted and ordered spread in full upon the minutes.

Dr. Carl Heitzmann then read the following memoir of Dr. Wedl:

"Many of the members of this Society will recall the venerable figure of the German savant, who, spending a couple of months in the United States in 1882, was tendered a dinner by a number of prominent dentists in this city. His amiable manners, his modesty and kindness, must have struck every one who had the privilege of conversing with him,—the more so as he had remarkable control over the English language. Since Wedl was my first teacher in microscopy, and I have worked with him from 1859 to 1874, the year of my departure from Europe, I beg to furnish here the main data of his life. He fully deserves this honor for what he has done in the science of odontology.

"Wedl was born in Vienna, Austria, on October 14, 1815. In that city he had his collegiate education, receiving the degree of M.D. in 1841. He spent several years in general practice, never finding satisfaction in this calling. After a journey through France and England, in 1844, he determined on the study of histology and pathology, which doctrines, at that time, were in their infancy, nursed by such men as Bichat in France, Addison and Beale in England, Theodor Schwann and Johannes Müller in Germany. Wedl settled in Vienna, and after having published a number of researches, became professor of histology at the University of Vienna in 1853, which chair he held until 1885, when, having reached the seventieth year of his life, according to the law of Austria, he resigned his professorship, ever since living in retirement, almost in seclusion from the world.

"The number of Wedl's publications is large, and on topics widely apart; they were published mainly through the Vienna Academy of Sciences, of which he was a member. We find here a variety of observations on animal and vegetable parasites, among them a description of a fungus growing in dead dentine and bone; a number of valuable contributions to the histology and pathology of the vascular system, blood- and lymph-vessels. His standard work, 'Elements of Pathological Histology,' was published in 1854 in Vienna, and soon afterwards translated into English and edited by the Sydenham Society in London. Two large works of his were issued on the 'Pathology of the Eye,' and a number of pathological observations on the skin and the ear, partly by himself and partly by his pupils. The main work concerning dentistry is his 'Pathology of the Teeth, with Special Reference to Anatomy and Physiology,' published in Leipzig, 1870, and in an enlarged and revised second edition in 1889. The text of this book is German and English; it

is accompanied by a number of illustrations, both in the text and in an atlas, the execution of which had been a part of my work during a number of years. The second edition is accessible even at the present time, and ought to be in the hands of every scientific dentist for its intrinsic value.

"Wedl did not meet with many honors, nor with much acknowledgment for what he has done. Lack of ambition and a modesty truly German may account for this fact. Being a bachelor, who had to care only for his nearest kindred, he despised money, and spent a good deal for his yearly travels through Europe, Asia, Africa, and, in 1882, to America. Enjoyments in the line of cuisine or dressing did not exist for him. Nobody who did not know him personally would, upon meeting him accidentally, have taken him for the great savant he really was. His unassuming character is well pictured in his writings. He strictly adhered to the descriptive method, morphology and topography, without the least attempt at speculation or even conclusion. The value of his observations rests, altogether, in the collection of facts, often unbiassed to such a degree that he has been accused by some of lack of system. Nevertheless, his works will remain a rich mine of findings for future reference, in the completion of anatomy and pathology; time and age will never mar the observations of Wedl.

"To me, personally, Wedl has been not only a teacher full of wisdom and good advice, but also a friend with a warm heart and the best of intentions. Last year, while in Vienna, I met him for the last time. He bore his seventy-five years admirably well, being engaged in mathematical and archæological studies, laughing and scorning at the vanities of the world. He told me, smilingly, that he had an aneurism of the upper mesenteric or the splenic artery, which gave him but little distress. It was this disease that caused his death on September 21, 1891, at the age of seventy-six years.

"Blessed be thy memory, dear teacher, and still dearer friend! The scientific value of thy works will be everlasting. Thou wert the truest specimen of the modest, unassuming savant; the very proof that the pursuit of natural philosophy makes the pursuer content and happy."

Voted that the memoir be spread in full upon the minutes of the Society.

The secretary read a communication from Dr. W. C. Barrett, of Buffalo, N. Y., relative to the skull of an ancient Mound-Builder, which he presented to the Society. It was moved that a vote of

thanks be tendered to Dr. Barrett; also that the skull, together with the communication accompanying it, be handed to the curator to be labelled and placed in proper position in the osteological collection.

Carried.

The President.—It is my melancholy duty to inform you of the death of one of the best of men, Dr. C. A. Kingsbury, of Philadelphia, who passed away a few weeks ago. We shall see him on earth no more. He was a credit to our profession, and he will be greatly missed.

We will now pass to the paper of the evening, entitled "Obscure Pains in and about the Jaws," by Professor J. E. Garretson, of Philadelphia. Gentlemen, I take pleasure in presenting Professor Garretson.

(For Dr. Garretson's paper, see page 8.)

DISCUSSION.

The President.—Gentlemen, you have listened to an interesting paper and a very valuable one, in that it contains so many illustrations from Professor Garretson's personal experience. The paper is now open for discussion. Dr. Heitzmann, may we hear from you?

Dr. Heitzmann.—Mr. President, if you call on me for discussion, of course you do not expect that I will simply shake hands with Dr. Garretson and say he has read the best essay I have ever listened to. My nature is made of fighting propensities, and I cannot help taking exception to several points in the doctor's paper.

I find there are several things which I want to talk about. Dr. Garretson charged me directly, in speaking of the definition of pain, which he calls altered sensation. Suppose a man has no sensation at all,—so-called sensory paralysis,—what then? Pain is not an altered, but an exalted sensation; it is a plus of sensation, in contradistinction to sensory paralysis, which is a minus or lack of sensation.

Dr. Garretson.—Very good; but a man who is in a state of paralysis is not in a state of pain. Again, there is a certain exalted sensation, not entirely unfamiliar to young married men, which does not seem to be esteemed by them particularly painful, judging from their willingness to endure it. As here the very extreme of exalted sensation is referred to, pain cannot be one with exalted sensation. In offering a definition of pain in the term "altered sensation," I define quite as well my lack of knowledge as to what pain is. It is certainly altered sensation inasmuch as it is not

natural sensation; the plus or minus of the matter I really know nothing about.

Dr. Heitzmann.—Still, sensory paralysis is likewise an altered sensation. If we speak of pain, generally we mean a morbid condition of the sensory nerves. That from the central region, beginning from the strands, down to the finest extremities, any portion of a sensitive nerve, being injured, will cause pain. Hence we are able to understand why that poor fellow Dr. Garretson mentioned, with an exostosis in the foramen ovale, had such terrible pains. It sounds quite reasonable that that man could not localize the pain at all. I know of a case where a lady had such a neuralgia, and localized it in the upper jaw. Tooth after tooth was pulled out, and after all the teeth were gone the neuralgia was as bad as ever.

Dr. Garretson has given us a practical paper. I have not the least reason to militate against what he said from his stand-point, but he gave us also a few morsels of pathology, and there I beg to object to him. He spoke of the inflammation of the lungs. That is called pneumonia. Pneumonitis would be an inflammation of pneumonia; such a word does not exist. He spoke also of Peyer's glands being affected in typhoid fever. These are not glands; they are lymph structures, aggregated lymph-follicles, or lymph-ganglia.

Dr. Garretson.—If the gentleman prefers, let "aggregate lymph-follicles" or "lymph-ganglia" be the word. Virchow's definition is, "A lymphatic gland spread out over a surface." I use the term, Peyer's glands, "Peyeri Glandulæ," out of compliment to him who first directed special attention to these bodies. The difference between the doctor and myself is in no sense of pathological import, but wholly of synonyme. Regarding his translation of "pneumonitis," I presume he will discover, perhaps before going to bed to-night, that he has made one of the slips so common to most of us when dealing with the classics. The young members of your Society may have their attention directed, in the connection, to "Thomas's Medical Dictionary," page 554, edition of 1889.

Dr. Heitzmann.—Dr. Garretson spoke of a plastic lymph effusion. That is the old view of humoral pathology upon which we were brought up, but which has been considered erroneous for forty years. Virchow, whose seventieth birthday we celebrated a few days ago, overthrew the old theory. It is always an outgrowth of the tissues which makes the inflammation plastic.

Dr. Garretson, from his point of view, brought forth the possibilities existing in and about the teeth, and he beautifully narrated the seven or eight causes which may induce pain about the teeth.

He alluded to caries of dentine, but he did not mention a disease which perhaps is not so well known,—that is, inflammation of the dentine. Since Dr. Bödecker has studied this disease in my laboratory, I can speak about it. Many of the gentlemen present have seen an elephant's tusk which, in the midst of the ivory, had a bullet embedded. We know that the hunter takes as a target the eyes of the elephant, and the bullet sometimes misses its point and buries itself in the tusk, causing an inflammation in the dentine. A foreign body in the dentine works just the same as a splinter would in the skin, or a bullet lodged in the bone. Such a disease, —inflammation of dentine,—eburneitis,—although rare, I have seen occur in human teeth, and it causes excruciating pain. This disease, which Dr. Bödecker described in the *Dental Cosmos* several years ago, I might add to the sources mentioned by the essayist.

If people go to a dentist to have a carious tooth filled, it is because they are afraid of pain and anticipate it. In my youth I was, and still am, quite an energetic fellow, but whenever I suffered from toothache I could not work, and had no relief until the tooth was gone, until I found out that the dentists abroad were too lavish in pulling teeth. The cases which Dr. Garretson mentioned about supernumerary teeth are very interesting.

About two years ago, in this very Society, a tooth was exhibited which had grown from the nasal process into the nasal cavity. Taking into view such possibilities, the great art of the surgeon will be to find out the point where the sensitive nerve is attacked. I know of a case of a Polish Jew who came to Vienna, suffering with what he thought to be neuralgia. Whenever he walked, he had a throbbing in his head. He went to the greatest authorities in Europe, who treated him for neuralgia, and gave him lots of remedies, but no relief. So he came at last to Vienna and was examined very carefully by the best physicians, who could find nothing the matter with him.

The patient was out walking one day, with a friend of his, having his cap on his head as usual, and complaining bitterly about that terrible suffering. His friend turns, and begins to laugh as heartily as possible. The patient said, "Why, what is the matter with you?" The friend answered, "Look; on your cap you wear a tassel, and whenever you walk, that throbs on the front of your head. Remove the tassel, and you will have no more trouble." And so it was.

Neuralgia is an utterly dark field in many cases, and I envy Dr. Garretson for the wonderful faith he has in therapeutics. I

was raised in a sceptic school. I do not believe in remedies as much as Dr. Garretson does, and when he says he gets a cure for erysipelas by using that prescription with tincture of iron in it, it is because the remedy kills the microbe which I am satisfied causes the erysipelas. The air-tight covering of the skin, as in the case of the benzoinated salve, is in many instances sufficient to abate the disease. We imagine that benzoinated salve will cure it; just as often it will cure itself without anything. Faith you must have, of course. The older the practitioner grows the more remedies he has. The essayist reminds me of Dr. Fordyce Barker, one of the presidents of the Academy of Medicine. I was present when he said once that in his family practice there had never been a case of croup or diphtheria, because he makes the mother or the nurse of the child keep a remedy—turpeth mineral, an insoluble salt of mercury—which, if applied, will kill the croup at the very root, and the child cannot have a croup. Of course there was a wild excitement. All ran to the drug store for the remedy he named, the price of which rapidly increased. After a few months the doctors came to him and said it was of no use whatever. Of course the old gentleman was confused to find that it was of no benefit to them. That is the great blessing of faith, for we all know how unreliable medicines are. I was about to say, the older I grow the more sceptical I become.

Dr. Garretson.—Accepting myself to be aged in years beyond the distinguished member of your Society who has just spoken, I may hope to be excused in reversing his saying with an assertion that the older I grow the *less* sceptical I am. Principles I long ago discovered to be one with foundation. My dependence is never placed elsewhere. The facts of men must become principles out of reason of standing the tests of analyses before I am willing to consider them. I think I may assume to say that there is not a single fad in the whole thirteen hundred pages of the "System of Oral Surgery," even though I may not hope to have Dr. Heitzmann agree with me regarding primitive dental grooves, tunicæ propriæ, and tunicæ reflexæ. Specifics are not things in themselves, but things of relation with other things. A quarter-dollar buys soup only where soup is to be had. The "Cogito, ergo sum" implies thinker and instrument. Fracture-splints are not, efficiently, fracture-splints save where there are broken bones. Understanding lives with the *process* of *exclusion* and lives never anywhere else. I may, not unwisely, assume that mysteries as to medicines, as indeed to everything else, lie not elsewhere than with ourselves. No

truer does it show that cause and effect are relations of a common circle than is exposed the existence of antipodal things: belladonna, to make example, antagonizing opium and opium antagonizing belladonna. Concerning the "plastic lymph exudate," I am simply to reply that I am a humoralist, and refer any who may have interest in my opinion to the seventy-sixth chapter of the fifth edition of my Oral Surgery.

Dr. Howe.—I think the Society is to be congratulated on much that Dr. Garretson has said, that will be of great practical value to us. I was sorry that he did not enlarge on some of the points in his address. I hope he will give us the reason for his decision and the way in which he arrived at the conclusion to sacrifice that beautifully-filled tooth he mentioned. He left us rather to infer that he took it out because it was a filled tooth. I am sure there are many here who would like to pump Dr. Garretson—dry if possible—out of his large resources, but it would be a long process, and there is hardly time to-night. One of the things we want to know in our every-day practice is how to find out what is the matter with a patient who comes to us with neuralgia. A patient may have obscure pains about the face, and be referred to the dentist to determine whether the dental factor is concerned in the case. In the absence of ordinary lesions of tooth tissues, the dentist yet knows that there are pulp-stones, exostoses, partial and entire devitalization of pulps, and other obscure causes, which may possibly be involved. What signs or characteristics, if any, are indicative of dental lesions, or how shall we proceed to diagnose the case?

I would like to ask Dr. Garretson whether he coincides in any degree with the view that very many pains are the result of two factors? His reference to malaria and malarial pains in the teeth and to neurasthenic pains in the auriculo-temporal nerve suggests such a thought. In the case of the man whose skull is in the museum, with the spicula of bone projecting from the foramen ovale, the possibilities are that pain did not begin with the very commencement of pressure, but a weakened condition of vitality perhaps was a factor in the irritation. Perhaps I can more plainly suggest what is in my mind by referring to a common tendency to toothache in pregnant women, when an examination of the teeth, or tooth, reveals a lesion altogether inadequate, of itself, to account for the pain. Why should any pain locate in the teeth or be associated with the teeth, from malaria, unless there be a local cause? the latter, alone, often inadequate, but with another and more general factor sufficient, to manifest the irritation in pain.

I would like to ask Dr. Garretson to say a few words on that point before we go, and I would say that if the patient who suffers from neuralgia has been more subject to the pain when going out into the cold wind, or if coming into a warm room, or taking warm or cold food or drink, excites the paroxysms, or aggravates the symptoms, even if the teeth have not ached, I expect almost certainly to find the dental factor concerned in the disturbance. No doubt this indication is well known to most of those present, but I know it to be frequently overlooked by dentists.

Dr. Garretson.—In reply to Dr. Howe's first question, I am to say that the "beautifully-filled tooth" was removed by reason of being led to as the probable factor through pursuit of the process of exclusion. Going the round of the circle, the tooth remained as the only thing that I could not demonstrate to myself as not being a cause. If a single possible factor is overlooked in such pursuit of diagnosis through the process ef exclusion, a successful issue out of a case is, of course, not science, but accident.

Answering the second query, I reply that double *dis*es, or factors, are to be accepted as common. Syphilis, as a predisposing cause of jaw pain, must certainly be familiar to one and all; nocturnal exacerbations are reasonably diagnostic. Malaria distinguishes itself through periodicity. The neurasthenic state, as a predisposing, if not, indeed, as the active and sole, cause of neuralgic pains about the face region, is too familiar to me to admit of doubt. The hint lies with the suggestion of Dr. Howe that a localizing factor is more than likely present at the seat of pain,—a hint that is certainly most worthy of being carried in memory to our homes and thought over.

In conclusion, I desire to say to Dr. Howe, and to the members at large of the Society, that I have restricted what has been said by me to narrow limits by reason, first, that I feared to tire the patience of those present; and, second, because I did not want to intrude on time that might be more profitably employed in recital of experiences by others.

Dr. Howe moved a vote of thanks to Dr. Garretson for his interesting and valuable paper.

Carried, unanimously.

Adjourned.

S. E. Davenport, D.D.S., M.D.S.,
Editor New York Odontological Society.

AMERICAN DENTAL ASSOCIATION.

August 5, 1891.—Second Day.—Evening Session.

MEETING called to order at 8.40, with the President in the chair.

Dr. Walker.—As there are many dentists here from all over the country, many of them have requested me to ask if at this time it would be proper to have a report made in regard to the condition of the legislation that has recently occurred between the International Tooth Crown Company and the Dental Protective Association. I thought I would bring the matter before the Association to see if it would be proper to have a report made, and I move that the chairman be given five minutes in which to make a statement concerning that litigation.

This was adopted.

Dr. Crouse.—The case was lost. We got the unanimous vote of the Supreme Court in our favor. We have a suit pending which is to be a test suit on the Low Bridge patent. We have assumed the control of it, and it will be a test suit. It is not ended; it will probably be the most important we have had. We feel sure of winning this one. We were not sure of winning the other. I believe that when our testimony is all in, so the other side can see what we have in our possession relative to the patent, that they will never bother us again. We have plenty of evidence that makes us sure that we will beat them in the higher court, and we think we can convince them that we are right before they go to court.

The Low Bridge includes the banded crown with a tooth attached. It is a kind of dummy on a gold crown. You will see when the circular comes. We will have cuts illustrating, so that every one can see how important it is that we should win the suit and have all the evidence in our favor that we possibly can.

Dr. Shepard, on behalf of the committee appointed to examine into the affairs of the Dental Protective Association of the United States, reports that they have examined the books and accounts, and find them kept in a business-like manner; the affairs have been managed very economically; all bills have been paid, and the surplus is deposited in bank to the credit of the Association.

Dr. Barrett, chairman of the committee on the President's annual address, reported that the committee recommended several changes in the constitution, which were read by him.

Dr. McKellops stated a case in which a rubber-dam clamp had been swallowed by a patient, and requested Dr. Peirce to report the case.

Dr. Peirce.—Mr. President, Dr. Shepard has called on me to report what I stated to him. A week ago a dentist in Philadelphia called on me with his patient. He had in his hand a rubber-dam clamp of the largest size, and he said his patient had swallowed a clamp of that kind, and asked me what to do. I told him to go to Dr. J. Solis-Cohen, about four doors above me. They left my office. On the day before I left Philadelphia I met Dr. Cohen, and asked him about the matter. He said, "I took hold of the clamp with my forceps, but I found that I was so lacerating the œsophagus that I would irreparably hurt the patient. I told him to go home and live on mashed potatoes for two days. Yesterday the patient brought me the clamp, which had been passed without pain. When anything is swallowed into the œsophagus, I direct my patient to exist on mashed potatoes for a while, and that invariably passes the obstruction into the stomach, then into the alimentary canal, and so ends the trouble."

Dr. Brophy.—I believe the paper of Dr. Barrett calls for some discussion. I think some of the members of the Association who were not here at the time the paper was read may desire to say something. Some may not have been able to discuss it when the paper was read.

No one desiring to speak, the subject was passed.

Dr. John S. Marshall, of Chicago, read a paper on the use of pyoktanin in the treatment of cancerous growths.

PYOKTANIN BLUE IN THE TREATMENT OF CANCEROUS GROWTHS, WITH ONE CASE IN ILLUSTRATION.

BY JOHN S. MARSHALL, M.D.[1]

Mr. President and Gentlemen,—I desire to call your attention to the new antiseptic drug pyoktanin and its use in the treatment of cancerous growths.

Pyoktanin was discovered by Professor J. Stilling, of Strasburg, Germany. It is one of the aniline compounds and a powerful antiseptic.

There are two varieties of the drug, one of a yellow color and

[1] Oral Surgeon to St. Luke's Free Hospital and Mercy Hospital, Chicago, Illinois.

the other a deep blue; each produces a corresponding deep stain. The blue dye has greater antiseptic powers than the yellow, and is generally given the preference when the deep purple color imparted to the tissues by its use is not objectionable.

Professor Stilling and Dr. Wortmann, after making careful and elaborate chemical and bacteriological research, claim for pyoktanin as an antiseptic,—

"*First.* It has no injurious effects upon the human organism.

"*Second.* It is absolutely destructive to all bacteria or other micro-organisms absorbing it.

"*Third.* It rapidly permeates and diffuses through both healthy and diseased tissues and fluids, and penetrates the enveloping membranes and internal matter of all bacterial colonies harbored by them."

For antiseptic purposes it is used in aqueous solution, the strength ranging from 1 in 1000 to 1 in 100, the parts being irrigated or painted with the solution. The only objection to its use by these methods is the discoloration imparted to the surrounding tissues and the staining of the clothing; these stains, however, are easily removed by washing in alcohol.

Dr. H. J. Bolt, of New York,[1] speaks very highly of pyoktanin blue as an antiseptic in connection with the treatment of various suppurative and purulent conditions coming under the notice of the gynecologist.

Dr. Roswell Park, of Buffalo, says (in "Annals of Surgery") that pyoktanin cannot be relied upon in surgical practice except in such strength as to make it dangerous. In gonorrhœa it is disappointing. Upon granulating surfaces it exerts a desirable effect, but is no more valuable than other substances as easy of access, while the stain is often objectionable. In ophthalmological practice it has not come up to the requirements of the day. It has few qualities not possessed by numerous other drugs of its class, and on the whole it is disappointing.

For a few weeks only I have been testing its value as an antiseptic in the treatment of phagedenic pericementitis, but am not prepared to give the results of these experiments at this time, as it is my intention to present them to the profession in the form of a separate paper. This much, however, I may say in regard to it, that it gives promise of being a valuable addition to our yet very meagre armamentarium for combating the effects of this disease.

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[1] Journal American Medical Association, July 11, 1891, p. 76.

The field, however, in which at present it seems to give the greatest promise of usefulness is in cases of cancerous growths of all varieties which have passed beyond the hope of successful removal with the cautery or the knife, by mitigating the sufferings and prolonging the lives of these unfortunate individuals. Although no positive cures have yet been announced as resulting from its use, many have been greatly benefited and some few have been so far improved as to hold out the hope of a positive cure.

In an article by Dr. Willy Meyer, of the German and New York Skin and Cancer Hospitals, which appeared in the *Medical Record* of April 25, 1891, will be found a *résumé* of the opinions of the most eminent German surgeons upon its use and value in the treatment of cancerous growths, with the cases upon which it had been used and the results so far obtained, together with histories of four cases treated by himself.

Let me quote a few paragraphs from this most interesting paper.

"Stilling mentions in his second paper that he succeeded in curing with pyoktanin an extensive exulcerated epithelioma of the face (ulcus rodens) which, beginning in the middle of the dorsum of the nose, involved the entire wall of the lachrymal sac and half of the upper eyelid.

"On January 30, 1891, Professor von Mosetig-Moorhöf read a very interesting paper before the Vienna Society of Physicians 'A Contribution to the Treatment of Inoperable Malignant Growths,' in which he reported on his experience with pyoktanin in such cases.

"Stilling was the first to suggest parenchymatous injections of aniline dyes in inoperable neoplasms, and advised the use of such dyes as will dissolve slowly in a six-tenths-per-cent. solution of chloride of sodium,—viz., blood. He recommends this precaution to guard against the too rapid diffusion of the injected fluid through the tissues and the possibility of the dye entering the blood, as he feared the absorption of too large a quantity by the red corpuscles might possibly destroy their function and thus endanger life. He is of the opinion that the blue dye is best for parenchymatous injection, as it is the most powerful antiseptic of this class of drugs and is soluble in only seven-tenths to eight-tenths part in 1000 of water.

"With regard to its practical application to cancerous growths, he suggests the employment of Nussbaum's method of treatment first, which is to tie the principal arteries which supply the neo-

plasm to arrest its growth, and then to inject the tumor in all its parts with a solution of pyoktanin blue.

"Von Mosetig presented four of his cases, previously referred to, at a recent meeting of the Vienna Society of Physicians (March 13). The patients had all been materially improved, but were not yet cured. Von Mosetig concludes that we had better be careful with this treatment in cases of malignant growths which have developed in the neighborhood and around large blood-vessels. He is inclined to avoid injection into the tumors which involve large veins, and also into those which cannot easily be reached by the needle of the syringe. He now prefers a solution of 1 to 500 as a standard solution, which is filtered through heated asbestos to remove undissolved crystals, which might plug the needle, and makes the injections in a concentric manner, letting his needle enter into the surrounding healthy tissues. In several hundreds of these injections neither he nor his assistants have ever seen any untoward accident. Microscopical examination of extirpated pieces of three different new growths, which had been injected, made by Riehl, of Vienna, demonstrated that the nerves, muscles, connective tissues, and young epithelial cells were diffusely dyed, but the nuclei only slightly, or not at all.

"Billroth is rather sceptical in regard to the value of pyoktanin injections in cases of malignant growths. Three patients, having far-advanced sarcoma (posterior aspect of thigh, sternum, popliteal space), got worse; one of them died of sepsis. The tumors were softened and the covering skin was perforated. This occurrence can only be looked upon, according to Billroth, as unfortunate to the patient. The exulcerated growth troubles the patients much more and will render their condition more dangerous. Patients afflicted with exulcerated growths also did not improve. Billroth does not believe that pyoktanin, when injected, has any specific influence whatsoever, but that it is merely the water, which, forcibly pressed into the tissues, makes them swell and later unable to live. The researches are continued in his clinic."

Dr. Meyer reports having tested the value of the drug in nine cases at the hospitals and two cases in private practice. The histories only of the first four hospital cases are related in his paper.

It would be extremely interesting to review in detail the histories of these cases, did time and space permit; but it will be sufficient for our present purpose to say that the report shows that marked improvement followed the treatment in each case, the severity of the pain was greatly mitigated, the diseased tissue took

on a more healthy appearance, and in every case the tendency to spread to adjoining tissue seemed to be arrested.

In summing up his experience with pyoktanin, Dr. Meyer says,—

"In reviewing these four histories, and also considering my experience with pyoktanin as well as ethyl pyoktanin in my private patients, I should like to state the following facts in regard to the treatment of inoperable malignant growths with these aniline dyes, as far as they have been exhibited up to date (April 8):

"The aniline dyes, applied on the surface of exulcerated growths, in ointment or powder (about 1 to 200) or in substance, have a strong analgesic effect.

"Parenchymatous injections of pyoktanin solution (1 to 300), repeated every second day till fifth day, the dose not exceeding one and one-half drachms, have in my cases proven to be innocuous to the general system.

"The symptoms following the injections are either general or local.

"The general symptoms, which can also follow the internal use of methyl blue (as recommended for inoperable malignant neoplasms by Dr. Max Einhorn of this city), are nausea or vomiting, weak and slow pulse, headaches, general malaise. These symptoms may come on the same day or the day following the injection; as a rule, they do not come at all; now and then there is a slight rise of temperature, usually subsiding within twenty-four to forty-eight hours.

"The local symptoms are,—

"1. Pain following the injection. It may be of long or short duration, slight or severe. It is more severe where the cancerous infiltration affected by the injection is dense (epithelioma of face, disseminated cancer of breast, etc.). It seems that local anæsthesia may follow the injection.

"2. Œdema, coming on either acutely, and then accompanied with slight redness (non-inflammatory) and pain on pressure, or rather in a subacute form. This serous transudation of the growth may be the first step to reabsorption. The slight fever, observed in a number of patients, soon following the injection, had then to be looked at as being an aseptic one, possibly due to this reabsorption.

"3. Breaking down of the injected tissue, with perforation of the skin, or scar, which latter is the result of the operation (aseptic necrosis). By using a strong solution (1 to 200) the necrobiosis seems to be more rapid in smaller nodules. It may be advisable to

use a weaker solution (1 to 500, instead of 1 to 300), as we can thus dye a larger portion of the growth in one sitting without increasing the dose of pyoktanin. We then inject a larger quantity of solution and still need not apprehend general symptoms. Perhaps the weaker solution will not destroy the tissue so rapidly, and thus rather induce reabsorption than necrosis. The sinus or sinuses established by the breaking down of the tissues give exit to a thick, dark-blue fluid, which, by microscopical examination, proves to be not colored pus, but *débris* of the injected neoplasm. It is generally intermingled with shreds of necrosed tissue. We also have to prove yet whether operative interference in this stage will really benefit our patients. Perhaps nature gets slowly rid of the necrosed tissue without help. As it seems, the carcinoma tends more to necrobiosis and perforation during this treatment than the sarcoma. I personally could so far only subject cancer cases to the color cure. (Von Mosetig had his most striking results in patients suffering from sarcoma (see above). He maintains that the injections, made under antiseptic precautions into neoplasms, which are still covered by healthy skin, produce necrobiosis and fatty degeneration, which is not followed by perforation but by reabsorption. Billroth, on the other hand, saw rapid softening and perforation in two out of three patients who suffered from sarcoma and were treated with the injections.)

"4. Breaking down of the injected tissue (necrobiosis), with subsequent reabsorption (Cf. 3). This will probably be oftener seen if we stop the injections for some time as soon as spots in the growth have softened, and only start them again after these spots have shrunk (provided, of course, that they did not perforate). Small, hard nodules in the skin, as seen especially in the disseminated cancer (recurring cancer of breast), can entirely disappear in a very few days, even if the pyoktanin solution was injected into their base. Perhaps the rapid disappearance is not reabsorption, but only an illusion, which is caused by œdema of the immediate surrounding tissue. A number of the nodules reappear after a few weeks, sometimes rather multiplied. The attempt at dyeing these small nodules directly, by pushing the needle right into them, is frequently unsuccessful, even in regard to the microscopical appearance, and causes severe pain.

"An infiltration of hitherto healthy tissue with the neoplasm, in consequence of this treatment, has not been observed in a single case.

"In no case did the growth spread during the treatment.

"Applications of pyoktanin in substance on exulcerated tumors slowly remove the diseased tissue in the shape of dry gangrene. There is no suppuration under the eschar, on account of the strong antiseptic qualities of the dye, and consequently no cachexia. Pyoktanin is, however, no deodorizer. It is also no stypticum.

"It may be advisable to combine the parenchymatous injections and local application of pyoktanin with giving aniline dyes internally. Pyoktanin is, in my cases at least, not borne by the stomach. Methyl blue seems at present to be the most preferable."

The reading of Dr. Meyer's paper greatly interested me from the surgical stand-point, for it so happened that just at that time a private patient, Mr. H., American, aged forty-one, general health good, family history good, referred to me by Professor Arthur B. Freeman, was suffering from a very extensive malignant neoplasm (small, round-cell sarcoma) originating in the antrum of Highmore, involving the right superior maxilla and malar bones, etc.

An operation, with the assistance of Professor Freeman, had been made for the removal of the growth in the antrum, on April 2, 1891, but so rapid was the extension of the disease following this procedure, that the second one, with the assistance of Professor John Owen, was performed on May 12 following, when the entire right superior maxilla, malar, palate, and turbinated bones, with portions of the sphenoid, were removed. The first manifestations of the disease were discovered only six weeks before the first operation. Ten days afterwards, when the patient was allowed to leave the hospital for his home, there was forming over the right ramus of the inferior maxilla an extensive induration.

It was determined, by the consent of the patient, that if there should be positive indications of farther spreading of the disease, or recurrence, that we would immediately begin the use of pyoktanin by parenchymatous injection.

I was led to this determination by the hope held out in the results which had followed its use in cases of a similar nature reported by Von Mosetig-Moorhof.

May 28.—The induration over the right ramus had assumed the size and shape of a hen's egg somewhat flattened laterally, and was unmistakably a farther extension of the disease.

Parenchymatous injections of a solution of pyoktanin 1 to 500 in a six-tenths-per-cent. solution of chloride of sodium in distilled water were commenced at this date.

Twenty minims were injected into the substance of the growth

at four different points, five minims at each point. The utmost care was used to insure perfect aseptic conditions of the external surface of the tumor, the needles and syringe, the hands of the operator and the nurse, and in the preparation of the solution itself.

The following day the axillary temperature showed an elevation of one degree (at 9 A.M. it was 98.4°, at 2 P.M. it was 99.4°), which fell to normal in the evening. No other general symptoms were manifested.

May 31.—Parenchymatous injection of pyoktanin twenty-five minims at five different locations, five minims at each place.

Temperature remained normal; tumor larger and feels very hard.

June 3.—Injected thirty-five minims divided between four locations, endeavoring to reach a new point at each time. No elevation of temperature; tumor increasing in size.

June 6.—Injected forty minims, as before. Temperature normal, no unpleasant symptoms, appetite good. Pain in the region of the temporo-maxillary articulation and sense of fulness following the injection.

Skin over the tumor is tinged slightly purple.

Tumor about the same size, perhaps a little larger, and very hard.

June 8.—Injected forty minims, as before. Pain quite severe after the injection, evidently from the pressure of the solution; this gradually subsided in half an hour. No elevation of temperature or other constitutional symptoms.

June 10.—Tumor seems to be somewhat smaller. Injected forty minims. Decided to double the intervals between the injections, as the tumor seems to be thoroughly dyed, and watch the results. Skin over tumor quite purple.

June 14.—Tumor has been slowly but certainly decreasing in size since the last date, and has softened very considerably. Injected sixty minims divided between six different points. Pain quite severe for a few minutes after the injection.

June 17.—Slight redness at upper part of tumor; looks as though the skin was about to rupture; fluctuation quite perceptible at this point. Painted this location with collodion.

Injected sixty minims in lower part of neoplasm, which caused considerable pain for a little time.

Tumor slowly decreasing in size, most noticeable at upper part.

June 19.—Tumor ruptured upon the inner side into the mouth, discharging a considerable quantity of dirty-looking purplish fluid,

evidently necrotic broken-down tissue stained with pyoktanin. Tumor soft and much smaller. No injection.

June 21.—No injection. Tumor soft and greatly reduced in size and discharging same dirty-looking fluid. No evidences of suppuration.

June 26.—Neoplasm still decreasing in size; discharge has ceased. Patient feels so much better that he desires to return to business.

Small point of coarse granulations near the anterior border of the velum palate. Injected thirty minims in this location.

July 1. Neoplasm has nearly disappeared, and the patient has gone back to his business.

The coarse granulations referred to have disappeared; they were doubtless due to irritation from the packing used to close the cavity into the nose.

July 13. Patient reported to-day for examination. Neoplasm has entirely disappeared. Discovered another point of coarse granular-looking tissue at the bottom of the cavity; applied pyoktanin (1 to 300 of lanolin) upon a piece of absorbent cotton held in place by the packing above referred to.

July 16. The coarse granular tissue at bottom of cavity has disappeared. Patient cautioned not to irritate the surface of the cavity by undue pressure of the packing, and instructed to report at once if at any time there should be evidence of recurrence.

REMARKS.

In the exhibition of the drug in this case I endeavored to profit by the experience contained in the published reports of others.

From the fact that in all the cases reported by Dr. Meyer the drug was not borne well by the stomach, I refrained from administering it in this manner; and as there was no external ulcerated surface, the use of stick or powdered pyoktanin was not indicated.

I chose the 1 to 500 in six-tenths-per-cent. chloride of sodium solution as being the safer strength, beginning the injections with twenty minims, and gradually increasing them to one drachm for the same reason.

The possibility of septic infection was guarded against by strict antiseptic precautions, and the needle wounds were covered each time with collodion.

From the beginning to the end of the treatment there has not been the slightest evidence of constitutional disturbance from the use of the drug, save the elevation of temperature of one degree, which occurred on the day following the first injection, and which,

I am quite inclined to believe, was the result of anxiety as to the outcome of the treatment, rather than to the influence of the drug. Pyoktanin in this case has certainly proved very beneficial, and gives promise of establishing a complete cure. Time only will demonstrate whether this promise is to be fully realized.

One thought further: The impression has been gradually growing in the minds of not a few noted surgeons, both of Europe and America, that the clinical facts surrounding the location and progress of primary carcinoma, and possibly sarcoma, in all their forms, would indicate an entirely local origin of these neoplasms, and that they might be caused by the lodgement or ingress of a specific micro-organism entering through abraded surfaces and wounds. I therefore ask, May not the results so far obtained in the use of this powerful but innoxious antiseptic drug—pyoktanin—upon malignant neoplasms be a further indication that this may be the correct theory of the origin of these growths, and the line upon which further experimentation will give the greatest hope of success?

If pyoktanin does not prove to be permanently efficacious, may we not hope that some other drug will yet be discovered, through the combined efforts of the chemist and the bacteriologist, that will eventually conquer this dreadful and loathsome scourge of humanity?

ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.

At the regular monthly meeting of the Odontological Society of Pennsylvania, held November 14, 1891, the president, Dr. Louis Jack, introduced the essayist of the evening, Dr. Rodrigues Ottolengui, of New York, who read his paper entitled, "A Study in the Regulation of Teeth."

(For Dr. Ottolengui's paper, see page 18.)

Dr. Ottolengui, on concluding the reading of the paper, referred to drawings on the board explaining them, and said,—

Another instance where a special clamp had to be devised for moving with a jack-screw was where Dr. Kingsley was regulating a set of teeth in which in the beginning there was a temporary molar removed, and during the progress of the case the bicuspid came down into position practically within the arch, and interfered with the work that was being carried on to such an extent that it became expedient to stop moving that tooth into position; more-

over, the teeth on the opposite side of the jaw were very short, and it would have been impossible to put a plate in there which would have had any bearing upon the tooth, because the palatal cusps were too short. In this case I devised an instrument that did the work. An impression on each side of the mouth was taken separately and models made. This is to be remembered that, however short the tooth is in appearance above the gum, the whole tooth is present in the jaw. Consequently, with the plaster model before you, you can carve away the plaster till you have a fairly long tooth.

Now, around the bicuspid which was intended to be moved and around one on the opposite side I fitted bands made of pure gold burnished to the teeth. Then the two bands on one side were soldered together like the figure eight, and to that was fitted a little plate about three-quarters of an inch long and half an inch wide, which went over that part of the gum and was soldered to these bands, and on the plate was soldered a slot for one end of the jack-screw, and the band on the other side had soldered a little point for the reception of the jack-screw, and then the teeth were thrown out in about five days. So the jack-screw can only be used in extraordinary cases by some knowledge of obstacles and how to overcome them.

I wish to say one word about this other drawing (referring to board). I had intended bringing with me a set of models which were sent to me by another dentist.

They were evidently taken in some plastic material, and presented a drawn appearance around the teeth. He then had, seemingly, painted them with ordinary house paint and mounted them on an ordinary articulator, the plaster used to hold them being left as it was poured and white in color, and the whole thing was poorly made. He brought in the models and asked advice, which, of course, was refused without an opportunity to see the patient. Nothing could be told by these models, but when the patient came in I admit I was very much surprised to see what he had gained, because he had really made the jaw in six weeks quite presentable, and yet all the work he did was thrown away; and that is the reason why I wanted to notice the case.

This represents in a way (referring to board) what I wanted to demonstrate. The first glance would show that this tooth needs regulating, the tooth being within the arch, and in the six weeks he had made this tooth come into alignment, but an examination now of the jaw shows that the lower jaw closes imperfectly. The lateral

incisor was nearer the correct position, and the other teeth should have been driven back instead of the upper incisor being driven out.

Dr. Kirk requested Dr. Ottolengui to go over again the line of reasoning which he adopted in the first part of his paper by which he determined whether he would widen the arch or move forward the central incisors.

Dr. Ottolengui.—That was a simple case. A close examination shows that not only are these teeth wrong, but at present the general effect is that it is a symmetrical jaw. We expect a fairly curved line in the jaw, and if these models will be opened and looked at in that way you will see what a marvellous difference there is between it finished and its first appearance, as before it was a straight jaw, being a straight line on each side. The lower jaw is retracted in reality. The incisors turned up the lip in a way that made a very ugly appearance. (Illustrated by a drawing on the black-board, showing the sides of the upper lip protruding noticeably by reason of the projecting teeth.)

Of course it could have been retracted, I suppose, by taking out the teeth, but as long as we had arranged to jump the bite, it was advantageous to widen the jaw, because if you attempt this operation without doing this, you cannot get good occlusion.

Dr. Roberts inquired how long he was in correcting the irregularity from the time he started until he put the retaining appliances in place.

Dr. Ottolengui.—There were just six weeks used in widening the arch, I think two weeks for correcting the irregularity in the front of the mouth, and three or four months for jumping the bite.

I might mention in that connection a reason that would account for the length of time it required. I made a retaining plate for the patient, and the first one was very comfortable; but the span was too far back, and afterwards I took an impression and made a new plate which would do the work, and she came to the office without this, and it required four or five weeks to get the plate from her, because it was more comfortable, and she would wear it. Unless I could have secured that, I suppose the bite would never have been jumped.

Dr. Kirk.—I am very much interested in this subject. At present I have four cases of this type of irregularity on hand. Two of them have been completed and two are in process of regulating now, and the feature of widening the arch in relation to this form of irregularity is, I think, quite interesting. I have examined the

models more closely since asking the question, and I find there has been a gain in width at the cuspid teeth of nearly one-eighth of an inch. I should have adopted the plan of moving outward the central incisors first, because it would not have occurred to me to widen the arch as a preliminary. The jump of the bite is quite an important feature of the case. The lower jaw was retracted and held in an abnormal position by the irregularity of the superior central incisors. As soon as released the lower jaw took its normal forward position. The additional widening of the arch seems to have produced a more symmetrical form of the face than could have been had under any other method of treatment.

To my mind the apparent protrusion of the upper jaw was not an abnormal condition. In regard to moving outward the central incisors, the method described is quite ingenious and applies particularly to this case; but for four similar cases of my own I have adopted the plan, which I published some time ago, of using piano wire (indicates on the board), carrying the clasp around the molar, soldering on the outside of each clasp a little piece of gold tube, closing one end and leaving the other open, and then bending the piano wire to a U shape and letting it run into the tube sockets. These two clasps are united merely by a little silver plate which is used for the purpose of securing greater rigidity in the abutment.

I have used a modification of the same plan by putting tubing on the inside, with a slot cut in it and with buttons fastened on the free ends of the wire, carrying the wire inside of the arch, and tying the teeth to the spring thus formed on the palatal side for drawing in incisor teeth.

There is another plan which I have used for retracting teeth which is very satisfactory, and that is to swage a cap of thin platinum plate, about No. 31 or 33, over the teeth, slightly perforating the sides of the cap and cementing this on to the molars, and having a button or hook fastened on at the lingual or palatal part of the appliance. By such an arrangement you can use it satisfactorily with rubber bands for retracting the teeth. It is sometimes necessary to keep the teeth separated, and these caps open the bite sufficiently to allow that, and it is perfectly firm in its place. When I first used the cemented caps I found the cement did not adhere, but by making slight indentations around the edge of this swaged cap I was able to make it adhere nicely. These two methods have given me very satisfactory results.

Dr. Kirk, at the request of Dr. Ottolengui, described the proper way of tying a ligature to avoid slipping

Dr. Roberts stated that he had used a modification of the appliance of Dr. Kirk, with the exception that, instead of piano wire, he had used half-round gold wire and cut a thread on either end. The nut comes up solid against the lug. Tie the band down to the tooth first and screw up the nuts. The patient can do it with a little wrench. Dr. Roberts had been very successful in that way. In conclusion he stated that he was very thankful to know the proper method of tying ligatures as had been so clearly illustrated by Dr. Kirk.

Dr. Guilford.—We all feel very much indebted to Dr. Ottolengui for coming over from New York and reading us his very interesting paper. I would like to agree with him in all he said, but am sorry to say I cannot. One of the cardinal principles in regulating the teeth is simplicity. The doctor has made a very fine operation, but it seems to me he has taken the longest and most difficult way of accomplishing it. By an examination of the models that we have I see no reason in the world why, in the one case where he extracted the first bicuspid, he could not have done exactly the same thing in another. By extracting the first bicuspid in the diagram (referring to black-board) he could have drawn the lateral and cuspid back. The models show that there is room after that, but by spreading the arch, throwing the central back, and bringing the lateral in and jumping the bite he has done a great deal of unnecessary work, according to my view. It seems to me the best way is to take out one or both of the bicuspids and draw back one of the anterior teeth; that could very easily have been done.

There is one other point in regard to widening the arch. It is an error that I think a great many practitioners fall into. The widening of the arch is sometimes necessary in one jaw and sometimes in both, but it is a very tedious operation and in many cases a very difficult one. If you expand the upper arch you have to expand both. Dr. Kingsley, one of our earliest and best writers, says that, after all, the great desideratum in regulating teeth is to have a perfect occlusion,—to have as many teeth brought into use as possible in the mastication of food. I find, on examining the models, that the occlusion between the upper and lower teeth, so far as the bicuspid and molar are concerned, is not good, and the bicuspid on the other side does not touch those on the lower more than one-third as much as it did in the beginning. So, I think, he has lost in the expansion of the jaw in that case, in the matter of occlusion. Wherever expansion of the arch can be avoided and occlusion is secured, I believe it is better to leave it so.

The other point is that we can often simplify a case by the ex-

traction of one or two teeth and get the same results that we would get by a more round-about way. In the first case I should simply have taken out the first bicuspid, and then by putting metal bands around the second molar and cuspid tooth, with little hooks properly placed, and by the aid of rubber bands, the teeth could be drawn back one at a time with very little difficulty; then taking the bands off the cuspid and putting the same on the lateral, drawing it back in the same way. It can be done, if the patient is not over seven years of age, in a comparatively short time. Pressing out the incisor tooth is also readily done, if needed, in a very simple manner.

I would like to take exception to some other things stated. He said that in taking the impressions for models he took them in plaster of Paris. There are some gentlemen who believe in plaster of Paris for all impressions. In going into the office of a dentist in this city, I was surprised to see on a table about five hundred pieces of plaster. He said he had been taking an impression of a case of irregularity. I have never had any difficulty in taking just as accurate an impression as I needed for cases of irregularity in modelling composition.

The essayist objects strongly to the use of the jack-screw. It can be abused,—there is no question about that. Where the patient is over twenty years of age, if we move a tooth too rapidly there is danger of devitalizing the pulp.

There is another point in regard to the rapid enlargement of the arch,—the danger of opening the suture where the two faces of the maxillary bones join each other. A friend of mine was exerting a great deal of pressure to expand the arch laterally; noticing that he was making unusual progress, he discovered that the sutures were opening, and he had to take off the appliance and let the case go for several months. The most powerful instrument we have for exerting pressure is the jack-screw. I use it wherever I can where great power is needed. Where less power is required I use the Coffin plate or metal springs, or something of that kind. When I want to work with rapidity, I cement platinum bands, with suitable lugs attached, to the teeth I wish to move, as well as those opposite them, and then exert pressure with the jack-screw. I see no objection to the proper use of the jack-screw. It is a very valuable instrument, and all it needs is to be used with care.

Dr. Deane asked Dr. Guilford if he did not think the bicuspids would regulate themselves, and that occlusion would be more perfect in a few years?

Dr. Guilford replied that he thought they would be better if they were farther back. I notice that one cusp in the upper jaw rests upon a corresponding cusp in the lower. Unless there is some pressure brought to throw that back, I don't see how it will ever take a proper position.

Dr. Ottolengui.—I think a great deal of the last speaker's criticism was due to the fact that he didn't hear all my paper or understand it. I certainly said nothing against the jack-screw, for I never have widened a jaw with anything else, consequently it would be impossible for me to speak against it. What I did speak of was certain obstacles in the use of the jack-screw, but it can be used intelligently, and I endeavored to point out some of those features.

I am glad that the last question was asked in regard to the possibility of jaws changing. Dr. Guilford raised the point that he could not see how that would correct itself without pressure. The pressure is produced in mastication. It is one of the agreeable things that, however irregular the jaw may be, the occlusion is generally good, except in cases of extensive protrusion of one jaw or the other. The removal of one tooth will produce elongation of another tooth, until occlusion is reached. So it is the power of mastication which will remove these obstacles.

The doctor spoke of a case of widening where the effect required an abandonment for months. I spoke of one in my paper where the suture had opened. I have seen it in a number of cases, and I rather like it, and I have never seen any harm from it, neither has Dr. Kingsley in the extensive practice he has had. In the case I have spoken of, the lateral teeth were hidden behind the centrals and bicuspids with no room to pass through. The jaw was widened in the hope of getting room to send the lateral out. At the end of a week it was seen that separation was occurring between the central incisors, which indicated that the suture was opening. Examination along the median line with the finger showed that the suture had opened, and the pressure was continued until the amount of room desired was obtained. A fixture was then put in which would keep the jaw at the point widened and regular. The case was continued without any regard to the fact that the suture was opened, and in about three months new bone was deposited all along the line, and was held permanently in place.

Where the jaw widens without opening the suture, what may happen? The alveolar process is simply taken up. After wearing the plate for three months there will be a tendency for the process to return to its normal condition, whereas, if you open the suture

and have a deposit of new bone between the separated portions, there is placed a permanent wedge there to keep the jaw from coming back.

A word about impression materials. I don't think it is ever necessary to break an impression into a thousand pieces. The more irregular the case, the more probability there is that the impression would break up, and the more necessity there is to take it in non-yielding material. It stands to reason that if the teeth, which stand in the arch irregularly, and the hard plaster will not come out, the wax will not; but if the plaster will fracture, you can afterwards take the pieces and put them together, and you have an accurate model.

I want to say a word about extraction of the tooth in this case. I can't say there was really protrusion of the upper lip. There was protrusion opposite the lateral incisors, so that when the mouth was at rest you could observe a disfigurement over these.

The corners of the mouth were drawn in, and that was the reason I concluded to draw the laterals in. That action reduced the lip. The extraction of a tooth would be, in my opinion, a most deplorable thing, for it involves a greatly-increased space. We very seldom realize how much space a tooth will make until we take it out, or how much wider this looks than the tooth did when it was there, and therefore I think widening of the arch was permissible and advisable, because it allowed jumping of the bite; it gave a wider arch and a more symmetrical one, and, to a certain extent, it relieved the crowded condition you find on that side.

A word about screws. I had one of those very trying cases this summer where a bicuspid erupted without the arch. There was room enough for its reduction by a slight change of the other teeth, and after a space was made it was merely required to have an instrument to bring it into place. It is quite true nature may have accomplished this unassisted, but it had remained in that crowded position for a year and a half, and, therefore, it seemed advisable to force it into position. I made a plate, putting a couple of hooks on it, and threw an elastic band around the tooth, and brought it into position in one week. Now, what was the harm in taking my elastic band, instead of working with a screw? Every one who makes a practice of using springs or screws instead of rubber will admit, when he looks over his cases, that it takes, it may be, five months to do that which can be done by continuous pressure in half the time. What may be lost by possible danger to the tooth by moving it rapidly is more than counterbalanced by the comfort

of the patient, and in causing the appliance to be worn not more than half the usual time. I think the nerves of the patient are to be considered as much as anything else. In the appliance of Dr. Kirk's I cannot see any special use of the connecting-plate. I had a case within a week in which I was in a quandary whether to make such an appliance or not, and I was satisfied that a single band was not suitable and it would not hold, and I made an arrangement similar to that described and fitted it to the mouth. I asked Dr. Kingsley what I would gain by attaching them by a plate. He replied that he did not know; and neither do I. I don't see what can be gained. It only adds something for this clasp to do. The clasp would have to hold the plate up as well as itself. Where you can get two molars with anything like a knuckle on them, make a rubber wedge and fit that clasp to go to that point and keep them wedged until the appliance is placed, and as soon as it is pressed down you have a point that prevents that clasp from riding up. You can always force it up, because half-round wire is always wedge-shaped, and it won't slip.

Dr. Truman.—I appreciate the difficulty of discussing a case of this kind, when the patient is not present, to take into consideration all the features of it, but I do want to enter my protest against a practice I consider physiologically wrong in the regulation of teeth. I cannot understand how we can go on moving teeth continuously without general disturbance to the individual. I am thoroughly of the view that all regulation should be made intermittingly. Time should be allowed for the individual to recover from the nervous strain and for the formation of tissue. As Dr. Guilford has stated, I think, very truly, that there is a liability of the destruction or strangulation of the pulp, and there is increased danger in the irritation of the pericementum. Slight irritation is absolutely necessary, in my opinion, for the reformation of bone which must take place after the moving of the tooth to replace that carried away by absorption. Now, if you advance too rapidly, an inflammation is aroused which may end in the destruction of the tooth. Therefore I do not approve, as a rule, of bands or ligatures moving with a continuous pressure.

I would like, before the subject is closed, for Dr. Ottolengui to give his views on that point. It seems to me a very important one in the regulation of teeth.

Dr. Ottolengui.—If we can move the teeth with rapidity it does not seem to me physiologically wrong.

If any one else in the room was under the impression that I

believed in risking the health of the patient by rapid movement of the teeth; I am very much pleased to have an opportunity of answering that question. As Dr. Truman very truly says, it is a physiological fact that there is danger in the too rapid motion of the teeth; but the question arises, What is a too rapid motion? If a tooth can be moved in eight weeks, it is more of an injury to take fifteen weeks to do it. It is important for a practitioner who is moving teeth to be able to appreciate when a tooth is being moved too rapidly. I don't see that it is giving the patient rest with an appliance in the mouth that works slowly, but the entire stoppage of the pressure for a week or two weeks, when it is seen the teeth are moving too rapidly, is the kind of work which I prefer. It is, therefore, an advantage to make an appliance that the patient can put on or off himself.

Dr. Kirk.—A very interesting point has been raised by Dr. Guilford in connection with this case of Dr. Ottolengui's which I don't think has been sufficiently answered or discussed. It involves the principle on which the irregularity should be corrected. If the models show anything, they show in the first place malocclusion of the two jaws. The lower jaw occupies an abnormal position. It shows that the lower bite occupies at least the width of one tooth or half a tooth back of its normal place. Also that the cause of the malocclusion is the abnormal position of the superior central incisors. By the method Dr. Ottolengui has pursued he has brought the occlusion of the jaws back to their normal condition; he has done the very best that could have been done in that case, while if the irregularity had been treated as Dr. Guilford advocated,—viz., by the extraction of the bicuspid teeth,—he would not have restored the normal articulation which has so greatly improved the case treated by the method of Dr. Ottolengui.

Dr. Guilford spoke of a case of a little girl where the upper teeth protruded much. As the patient resided outside of the United States and could not remain here, some appliance had to be used that could be operated by her local dentist under instructions. After extracting the two first bicuspid teeth above, a Coffin plate was made covering the palate and all of the posterior teeth. On the buccal surface of this plate a half-round gold wire was embedded, passing around the arch and terminating in a threaded round wire. This engaged with a nut fitted into a slot in the rubber on the opposite side. The object was to draw the anterior teeth back,—six of them. In a few months the teeth were brought into proper position.

(The appliance was further described, and the doctor stated that the results were very satisfactory, although the work had been done by a local dentist and entirely by written instructions.)

Adjourned.

Editorial.

RETROSPECTIVE AND PROSPECTIVE.

THIS number commences a new year and the thirteenth volume of this journal.

It becomes, therefore, an appropriate moment to restate the purpose of its existence and to review what has been done in the past. It cannot be out of place here to define the sentiment that every profession should have its periodical literature under its own control. This is necessary, not only for the freest development of thought, but for the growth of high patriotic spirit. The latter is probably more important than the former, for without the culture of the higher elements of professional life the whole aspect of professional effort must become dwarfed. The recognition of these principles, and the knowledge of the fact that dentistry for years had not, in this country, possessed under its own control a journal devoted to its interests, led to the establishment of the *Independent Practitioner*, of which this journal is the successor.

To this sentiment of loyalty, and to the necessity for the existence of independent journalism, we are uncompromisingly bound, and hold that no other class is really entitled to the free support of our profession.

We have the satisfaction of thankfully acknowledging the endorsement by the many leading men of every section who have steadfastly taken this journal. In the trials which attend the beginning of every such enterprise we have had the solace that many of the most intelligent and better men have been our readers, but we want more than this. We ask that every one should come to us, not only for the reason that the greater the number of our patrons the more liberal can we conduct our affairs, but that wholesome pride requires that each and all should be found among our readers.

In the past we have held to our colors, and have in a painstaking and faithful manner carried on the work of publishing the matter

placed under our control. We also have the gratification of knowing that this journal has given satisfaction to those who have been its regular readers, and this sentiment has been deepened by the knowledge that the subscribers are so largely composed of the most influential men of all parts of this country and of Europe.

An examination of our pages will show that they have contained a very large quantity of the most useful matter and that many of the papers have become of great value, which is attested by the frequency with which they have been copied. The discussions of the papers, to those who have carefully read them, have furnished a large amount of that living kind of information which comes spontaneously from men who are in touch with dental work.

The present period is, we believe, from various indications, the commencement of a new era in the experience of this journal. The circulation has been steadily increasing, and there are notable instances of renewed interest in its work.

In view of this increasing interest and of the additional strength of which it gives evidence, the promoters of this journal feel justified in making an earnest appeal to their fellows to join hands with them in the effort to enlarge the usefulness of the trust resting upon them.

DENTISTS AND THE AMERICAN MEDICAL ASSOCIATION.

THE last number of this journal (December) contained a circular letter from Dr. Dunglison, secretary of the American Medical Association, and an accompanying explanatory letter from Dr. Talbot, of Chicago, ex-president of the Oral Section of that organization.

The notice of Dr. Dunglison was remarkable for the absence of any allusion to dentists or the resolution adopted by the American Medical Association, and, as it stands, has no force with those holding the D.D.S. degree. There has been a constant misunderstanding in relation to the position occupied by dentists in this body, which is explained in the letter of Dr. Talbot, and there need be no further misconception in regard to the position occupied by those who hold the so-called "partial degree."

That this explanation will be satisfactory is exceedingly doubtful. It involves so many conditions that it practically makes membership in that organization impossible. The first requirement is

that an applicant for membership must belong to an association working under the code of ethics of the American Medical Association. In the second place, he must be a graduate of a department connected with a medical school or university; and third, if so connected, he must have taken the regular course with the medical students, omitting certain studies and replacing these with certain others.

The first condition is possible of attainment, provided a sufficient number of members of a local society should be willing to adopt the code required. Membership in medical local societies is impossible, at least in the East, for those holding the D.D.S. degree. This being so, we cannot understand how a dental society can be recognized as a whole; indeed, it seems directly in conflict with the constitution, which requires membership in medical societies.

The matter is so much mixed and so inconsistent with itself that explanation serves only to make confusion worse confounded.

If the society or club adopting the code can be represented, there will certainly be delegates sent and application for membership made by persons who have not complied with the second requirement by graduating from a department of a medical college or university.

It must be recognized that this open door, if it means all that Dr. Talbot claims for it, is a liberal construction of the constitution, and as such should meet with a generous response.

The third requirement means the rejection of all those not graduates of certain schools, or, in other words, it says emphatically to these schools, "Your graduates can never be recognized by medical men as specialists in medicine."

The question of recognition is not one that interests us, and, further, it has been amply discussed elsewhere. The only thing to be considered is, is it just? We cannot so regard it.

The degree of M.D. in the United States has been trailed in the mire from the first organization of medical schools. It should stand for the highest culture in this profession. Does it do this? Until within the last three years nearly three-fourths of all medical schools in this country had a course of two years, or two sessions of generally five months each. The report of the Commissioners of Education for 1885–86 gives the number of regular medical schools as ninety-four; of these, seventy-three (73) had courses of from one to two years; twenty-one (21), from three to four years. The report for 1887–88, the last issued, gives the number of the regular schools in the United States as eighty-

nine; of these, twenty-four (24) had two years, and sixty-five (65) had courses of from three to four years. Of this number in 1887–88, fifty-two (52) had courses of from five to six months, nineteen (19), over six months, and eighteen (18) failed to report.

It will thus be seen that up to the period of 1885–86 the M.D. degree was conferred in a large majority of the schools after two courses of about five months each, and even at the date of the last report there were still a large number graduating men in the same period. It cannot be denied that men have been sent out by the thousands, to stand by the bedsides of other thousands in their last extremity, with an amount of theoretical information so limited that it is not surprising that to the average layman the titles doctor and undertaker are nearly synonymous.

While dental colleges have been equally derelict in their duty in the past, there can be no comparisons drawn between the two conditions when the amount of work and responsibility in medicine is considered.

It must, therefore, be recognized that, however exalted the M.D. degree may be in the estimation of society at large, to the specialist it means something or nothing just in proportion to the amount of training and the character of that training.

The dental schools of the country have now, without any exception, three years, the majority with five months as a term. Under this state of things it may not be wholly inappropriate for the dentist of the near future to retort, with some degree of consistency, "We refuse indiscriminate association with men who make the impossible claim of having been educated in medicine in two years."

The main question now is, Is it possible that dentists can, in the present state of affairs, work harmoniously with medical men? No man can or should be recognized, no matter what degree he may hold, unless he is able to demonstrate that he has that above all degrees, knowledge and ability to place his information in practical directions for the good of humanity and for the advancement of science. We hold that a large proportion of dentists have arrived at that condition of culture, and are able to maintain not a mediocre position, but one that must reflect credit on themselves and medical science; for whatever has been acquired in a special study becomes legitimately part of the whole. It is time that dentists should abstain from asking for recognition. It is humiliating!

The appeal, if it can be called such, of Dr. Talbot, for dentists to

unite with those bodies of a truly scientific character, should receive earnest attention. The day is past for organizations such as we have had, and the line must be positively drawn between those who join societies for selfish purposes and those who have only the highest professional and scientific interests at heart. We believe this may be attained in an association in dentistry proper. If it exists in the Section of Dental and Oral Surgery of the American Medical Association, it is a positive misfortune to that body that it is deprived of the hearty co-operation of men worthy in every respect, but who cannot show that they graduated from a medical college, but are simply energetic workers in their chosen field of scientific research, with a degree that has not yet received the stamp of respectability from the social world. The highest attainment any one can reach is a self-respecting culture, and this will command recognition everywhere where civilization extends, and is not wholly dependent on parchments or the artificial bars that caste places round the recognized professions.

A LEGAL OUTRAGE.

Laws are usually passed for the protection of communities and individuals, and in order that equal justice may be administered, courts have been established. This, theoretically, is the basis of all law; but, unfortunately, this beneficent idea often fails through various causes, not the least of which may be found in the officious intermeddling of individuals and societies. This truism has been made clearly apparent in the effort to enforce the dental enactments of the various States. In some, societies have been modelled after the "Law and Order Associations." The motive for the origin of these has, doubtless, been of the most unselfish character, but history is full of examples of such bodies finally becoming odious from their tyrannical proceedings.

Our attention was recently called to a case occurring in Philadelphia which illustrates this view. There a society has been organized the sole object of which is the prosecution of violators of the dental law of Pennsylvania. Now, this law is one of the most satisfactory in the statute books of the various States, and if left to its natural development it would prove of greater value in the future than it has in the past, valuable as that has been.

The progressive steps taken by the organization alluded to has

finally led, very naturally, to overstepping the bounds laid out for its government, and, if continued, will certainly bring the whole question of dental law into contempt.

The law requires, very properly, that all practitioners should be registered; but there has been a good deal of misunderstanding in regard to this, and many mistakes have been made by individuals without any intention of violating any of its provisions. This is especially true of recent graduates.

The special case that calls for notice is that of a young practitioner of Philadelphia. This gentleman, by his scientific work, has made for himself an enviable reputation both at home and abroad. Possibly for this reason he was selected as a shining mark for this ill-advised action. Without previous notice, a warrant was issued, and the officer of the law waited on him while engaged in his professional duties. The officer insisted on serving the warrant at once, and it required argument and persuasion to prevent him from dragging the dentist through the streets of the city as a common criminal. Indeed, had this minion of the law performed his duty, such would have been the result. The matter will be settled in the courts, and we can there safely leave it.

What, however, is to be thought of men who openly violate in this manner, under the guise of a public duty, all professional practice? It seems to us that the societies to which they may belong have a duty to perform, and if they have any proper self-respect they will promptly place such individuals beyond the pale of professional recognition. They can have nothing in common with those who appreciate professional ethics or gentlemanly procedures.

Bibliography.

THE PHYSICIAN'S VISITING-LIST. Forty-first year of its publication. P. Blakiston, Son & Co., Philadelphia, 1892.

This well-known visiting-list is again presented, calculated for 1892.

Besides the metric, dose, and posological tables, it gives a list of new remedies, poisons and antidotes, disinfectants, etc.

Its general arrangement makes it one of the most convenient lists published.

Pearson's Dental Appointment-Book. R. I. Pearson & Co., Kansas City, Missouri.

This is a very convenient pocket engagement-book, with room for eight appointments for the day, with spaces for hour and operation. The date of the month has necessarily to be inserted, a serious objection common to all of this class of special publications.

A Calendar for 1892, Designed in Colors. Lee & Shepard, Boston, Mass.

This beautiful calendar is composed of heavy gilt-edged cards fastened by a silvered chain. It is one of the most artistic of the many productions of this character which come to us at this period of the year, and indicates a growing taste in this direction worthy of special commendation.

An Abstract of the Symptoms, with the Latest Dietetic and Medicinal Treatment of Various Diseased Conditions. The Food Products, Digestion and Assimilation. Reed & Carnrick, New York, 1891.

This is intended to place in the hands of the active practitioner, in a condensed form, the more recent views in relation to digestion and assimilation. And although published in the way of business, contains much valuable material of special interest.

Obituary.

DR. CHARLES A. KINGSBURY, PHILADELPHIA DENTAL CLUB.

At a meeting of the Philadelphia Dental Club, held November 28, 1891, it was resolved that,—

Whereas, Dr. Charles A. Kingsbury, who had been a member of our Association from its organization in 1872, and who became endeared to us by his high intelligence, the goodness of his heart, and the probity of his character, has, under the Divine providence, been removed from this life, and that we unite with his friends and relatives in mourning his departure, and will keep in remembrance his cheerful Christian influence. Also,—

Resolved, That this note be engrossed upon the records of the club, and a copy be sent to his family, and also to the dental journals for publication.

Daniel Neall McQuillen,
Secretary.

J. FRANCIS FOLTZ, D.D.S.

DIED in East Boston, Mass., December 3, 1890, J. Francis Foltz, D.D.S., graduate of Boston Dental College, class of 1876.

The following resolutions were passed at the last annual meeting of the New England Dental Society, held in Boston, October 29 and 30, 1891:

WHEREAS, It has pleased our Heavenly Father to call from our midst a beloved brother, co-worker, and friend, Dr. J. Francis Foltz, of East Boston, Mass., therefore, be it

Resolved, That this Society loses an active member, whose faithful, earnest work is known throughout the profession.

Resolved, That this expression of our regret for his loss be entered upon the records of this Society, and that a copy of these resolutions be sent to his afflicted family and to the dental journals.

Signed: GEORGE F. CHENEY,
C. W. CLEMENT,
EDWARD B. DAVIS.

Attest: EDGAR O. KINSMAN, *Secretary.*

BOSTON, MASS., October 29, 1891.

Current News.

ANNIVERSARY MEETING OF THE FIRST DISTRICT DENTAL SOCIETY OF NEW YORK.

THE following is the programme of the Anniversary Meeting of the First District Dental Society of New York, to be held January 18, 19, 20, 1892, at the Academy of Medicine, New York City.

The essays to be read are—

"Pus Formation—Revived," by Professor D. R. Stubblefield, Nashville.

"A Plea for Replantation as a Cure for Chronic Alveolar Abscess," by Professor John S. Marshall, Chicago.

"Some Thoughts on Transformism," by Professor C. N. Peirce, Philadelphia.

"Borders between the Natural and the Artificial in Bridge- and Crown-Work," by Dr. Calvin S. Case, Jackson, Michigan.

"Adenoid Growths, Mouth-Breathing, and Thumb-Sucking, and their Relation to Irregularities of the Teeth," by Dr. Norman W. Kingsley.

Dr. Kingsley's paper will be illustrated by a number of casts of faces, models of jaws, and regulating appliances.

The following distinguished gentlemen have agreed to discuss the above papers: Dr. J. E. Garretson, Dr. C. N. Peirce, Dr. James Truman, Dr. S. H. Guilford, and Dr. Charles J. Essig, of Philadelphia; Dr. J. Taft, Cincinnati; Dr. John Marshall, Chicago; Dr. D. R. Stubblefield and Dr. J. Y. Crawford, Nashville; Dr. C. S. Stockton and Dr. S. C. G. Watkins, New Jersey; Dr. Thomas Fillebrown, Boston; Dr. E. C. Kirk, Philadelphia; Dr. G. L. Curtis, Syracuse; Professor Charles Mayr, Springfield; Dr. Frank Bliven, Worcester; Dr. F. T. Van Woert, Brooklyn; and Drs. J. N. Farrar, George Allan, and Charles Heitzmann, New York.

The following gentlemen will give new and interesting clinics: Dr. J. Y. Crawford, Nashville; Dr. George V. Brown, Duluth; Dr. Sydney S. Stowell, Pittsfield; Dr. F. T. Van Woert, Brooklyn; Dr. A. H. Gilson, Boston; Dr. John L. Gish, Jackson, Mich.; Dr. S. C. G. Watkins, New Jersey; Dr. W. F. Rehfuss, Philadelphia; Dr. S. E. Davenport, New York, and a number of others with whom we are still in correspondence. In addition, there will be a number of new instruments, devices, etc., shown by various manufacturers. The clinics will be held in the large clinic-room of the Academy, where there will be space enough for everything to be seen by all who attend.

The Trunk Line Association have agreed to sell tickets from points on their roads for one fare and a third on the following conditions:

(1) That at least one hundred persons who have travelled to the meeting on some legitimate form of railroad shall be in attendance; which fact shall be certified to by the secretary of the society, and also by a special agent of the railroads who will be in attendance.

(2) That all other provisions written on the back of the certificates shall be complied with.

Persons desiring to attend may bring with them any member of their immediate family. They must pay full fare to New York, and be sure to take a receipt in the form of a certificate from the ticket agent where they purchase ticket. This certificate, when signed, will entitle holder to return for one-third fare.

The profession are cordially invited to attend.

RODRIGUES OTTOLENGUI,
Chairman Executive Committee.

115 MADISON AVENUE, N. Y.

FIRST DISTRICT DENTAL SOCIETY, NEW YORK—SPECIAL ANNOUNCEMENT.

A MASS-MEETING of all interested in the Dental Protective Association will be held Wednesday morning during the anniversary. Dr. Crouse, of Chicago, will preside.

R. OTTOLENGUI.

AMERICAN ACADEMY OF DENTAL SCIENCE.

THE Twenty-fourth Annual Meeting and banquet of the American Academy of Dental Science was held at the Copley Square Hotel, Boston, November 11, 1891, about twenty-five members being in attendance. The meeting was called to order at 4 P.M. by the President, Dr. F. N. Seabury, of Providence, R. I. The annual reports were read and accepted, and the following-named officers were elected for the ensuing year.

President, Dr. Charles A. Brackett, of Newport, R. I.; Vice-President, Dr. Eugene H. Smith, of Boston; Recording Secretary, Dr. Charles H. Taft, of Cambridge; Corresponding Secretary, Dr. Edward N. Harris, of Boston; Treasurer, Dr. Virgil C. Pond, of Boston; Librarian, Dr. Edward C. Briggs, of Boston; Editor, Dr. William H. Potter, of Boston.

Executive Committee.—Dr. F. E. Banfield, of Boston; Dr. F. N. Seabury, of Providence; Dr. Thomas Fillebrown, of Boston.

After a vote of thanks had been extended to the retiring President, an interesting paper, entitled "Methods of filling Teeth Forty Years Ago," was presented by Dr. Seabury, followed by a paper by Dr. George C. Ainsworth describing a method of regulating upon the spring-band principle.

Following the discussion of the papers, the Academy gave its attention to the orator of the evening, Dr. George S. Allan, of New York, whose address was listened to with marked attention, and at the close of which a vote of thanks was passed and a copy requested for publication. At the request of several members of the Academy, Dr. Allan then related in a brief and informal manner some of his experiences in the use of bichloride of mercury as a germicide, upon the conclusion of which adjournment was made for the annual dinner.

The newly-elected president, Dr. Brackett, in a few well-chosen

words, opened the post-prandial exercises, which continued until eleven o'clock, when final adjournment was made.

CHARLES H. TAFT,
Recording Secretary.

15 BRATTLE STREET, CAMBRIDGE.

THE California State Board of Dental Examiners has had presented to it for endorsement a diploma bearing the heading of the "Medical University of Ohio." The diploma reads as follows:

"The Medical University of Ohio.
"Special
"Diploma.

"This certifies that John D. Van Vleck, M D., having successfully passed a special examination in the Department of Dentistry and Oral Surgery, is qualified to practise in the above departments.

"In testimony whereof we, the Professors in said departments and the President of the University, do hereby affix our names and the seal of the University of Cincinnati, Ohio, this 1st day in the month of March, in the year of our Lord MDCCCLXXXVIII.

"B. F. EVANS, D.D.S., M.D.
"CHARLES BRADLEY, M.D.,
Professor of Anatomy.
"G. W. VAN VLECK, A.M., M.D.,
President of the University.
"JOHN M. DIXON, M.D., Secretary."

Is any one familiar with such a university or department of dentistry?

ELECTION OF OFFICERS OF THE NEW ENGLAND DENTAL SOCIETY.—The following were elected officers of the New England Dental Society, at its last meeting, held October 29 and 30, 1891, for the ensuing year:

President, Dr. J. F. Adams, Worcester, Mass.; Vice-Presidents, Dr. S. G. Stevens and Dr. J. H. Daly, Boston, Mass.; Secretary, Dr. Edgar O. Kinsman, Cambridge, Mass.; Assistant Secretary, Dr. J. H. McQuade, Medford, Mass.; Treasurer, Dr. George A. Young, Concord, N. H.; Librarian, Dr. A. H. Gilson, Boston, Mass.

Executive Committee.—Dr. W. E. Page, Boston, Mass.; Dr. George F. Cheney, St. Johnsbury, Vt.; Dr. C. H. Hayward, Peterborough, N. H.; Dr. W. P. Cooke, Boston, Mass.; Dr. Marion L. Woodward, Boston, Mass.

EDGAR O. KINSMAN,
Secretary.

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THE MANAGEMENT OF DENTAL PRACTICE.[2]

BY LOUIS JACK, D.D.S., PHILADELPHIA.

MR. PRESIDENT AND MEMBERS OF THE NEW YORK ODONTOLOGICAL SOCIETY,—The chairman of your Executive Committee requested me to consider before you the topic which has been announced. This request must be the excuse for directing your attention to means and methods which have been peculiar to the conduct of my practice. It is on his assurance that the discussion of this subject may be of service that a natural reluctance to describe such matters has been overcome. While what is to be related to you will probably be of little benefit to those of established habits, it may prove of use to the younger men who are advancing to the stage of full practice. If this should be the result, the end will justify the means. The matter will be presented in the simplest and most direct manner.

It does not fall within the province of this address to consider the value upon practice of the fundamental requisites to secure professional success,—viz., professional training; general intelligence; moral rectitude; courtesy of manner, or personal neatness.

[1] The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

[2] Read at a meeting of the New York Odontological Society, November, 1891.

Without the combined possession of these characteristics there is little probability of any one securing a practice which would require methodical control. These elements are all so essential that at any stage of practice the loss of any of several may impair the career of any one.

One may, however, possess these qualities and yet not secure an adequate and deserved support. He may fail to make an impression upon his community for the lack of methodical arrangement of means conducive to the encouragement of patronage. Or the demands for service may, on the other hand, become so great that, for the lack of plans to utilize time and to control the demand, he may be strangled, as it were, by the abundance of patronage.

It is to the latter condition that I shall mostly direct your attention, because I believe the means which are best calculated to control an overpressure of practice are those which will prove most valuable to any one having the qualifications to entitle him to support, to secure the result each should aim for,—a life of effective and continued usefulness to his fellow-men.

The practice of dentistry is one requiring the closest attention to the duties involved in it by him who has assumed it. His office is to alleviate and prevent disease, and he cannot turn backward after he puts his hand to the plough. The obligation to stand ready to satisfy the demands made upon those engaged in dental practice are as imperative as are the obligations of the general physician.

Since the labor is exacting and makes the most severe strain upon the nervous forces of even the healthiest of men, it becomes every one to consider those matters which in any way may reduce this tension and maintain a state of constant efficiency.

Dental practice as usually pursued has not sufficiently regarded those economies of effort and arrangements of time which I am about to commend.

In common with others, I commenced practice by attending to the cases as they were presented; at length, as practice increased, I became hopelessly bound to conditions which overpowered me. To face the facts of strained health, deterioration of the quality of the service, and threatened reduction of income required the adoption of some system for the alleviation of these conditions.

This became established as follows:

a. In the arrangement of fixed hours for labor.

b. The avoidance of interruption, by refusing to receive calls or have consultations except at a certain hour of each day.

c. The distribution of the appointments evenly throughout the working months of the year.

d. The orderly arrangement of engagements for the care of the teeth, by which the distribution of time was effected, and also thereby to limit as far as possible the occurrence of the severe and protracted operations.

e. And at length the employment of a secretary to carry out these arrangements.

The first proposition is so manifestly correct that it needs little elucidation to enforce it. It is clear that the exhaustive nature of operative service in dentistry and the limitation of physical ability quickly determines the number of hours each one should sustain continuous effort. To perform good service the condition of the operator must be so maintained that each day, and every hour of each day, he should be in fit condition for efficient service. This cannot be the case if the strain is carried beyond reasonable limits, and he who makes daily demands upon reserved force by extreme effort is in danger of impaired vigor, lessened usefulness, and a shortened life. I have found, notwithstanding the possession of a considerable degree of physical resilience, that seven hours daily effort is the limit of my capacity. The period, however, of satisfactory labor must vary with individuals, depending upon the constitutional force and the intensity of the nervous energy peculiar to each one.

To have the attention confined to the cases in hand, to avoid the waste of time by callers for consultation, and to prevent the nervous friction inevitable to the interruption of important and delicate work, the second proposition was formed. The benefits of this arrangement are beyond calculation, and it works all through the conduct of practice with satisfactory results. The justness of the principle that the engaged patient is entitled to all of the time and the undisturbed attention of the operator is a question of the simplest justice. No other consideration should overweigh this.

The attempt was followed at first by resistance and criticism on the part of some; but the manifest right of the method so appealed to common sense, that as soon as knowledge of the intention was diffused acquiescence became general. The announcement of this arrangement was printed on the appointment cards thus, "that unavoidable calls are received at" a certain hour. The most convenient time for this was found to be after the consultation hour. A practice systematically conducted, however, will not have many unavoidable calls.

Another feature somewhat connected with this subject, and which was adopted before any means were attempted to reduce my practice to system, was the note printed on the engagement cards, reading, "that application for appointments should be made by note." This rule is continued in force. It is intended thus to restrict useless calls. The day is divided into three parts,—the morning, from 9 to 12; the noon, from 12 to 1.30, for examinations, consultations, and rest; the afternoon, until 4.30. This gives six hours for uninterrupted effort, and I venture that if any one will, in a similar manner, resolutely apportion the time, the effect will give the fullest satisfaction. These six hours proceed with complete quietness and without exterior causes of friction. It is also an important consideration that this repose and privacy is especially grateful to the persons under treatment.

The even distribution of appointments was a more difficult problem. The tendency of patients, if left to their own inclinations, when not influenced by dental troubles, is towards having regular attention given to the teeth in the spring and autumn. These periods, therefore, are disposed to be overwhelmed with applications for appointments, with consequent rushing to meet the exigency of the situation. The remainder of the year may not be sufficiently occupied to be stimulating to either body or mind.

Recognizing that the need of dental service by all classes of the community is a certainty, and that the best interest of the patient and the greatest satisfaction of the practitioner is to be secured by regular service rendered to each one, I have for over twenty years maintained a regulated system of notification for renewal of appointments for the care of the teeth. To this the thoughtful and those appreciative of the value of the teeth gave ready acquiescence. Within a few years it became so general that in case any one was overlooked it was usually considered a ground of complaint. In making such renewals I have, however, been careful to give the reasons for this course, and have been thoughtful not to trench upon the liberty of the person, since it is a natural feeling to resent being controlled by others. On the completion of each series of operations, each one, or their representative in the case of children, is informed that a re-examination should be made in from three to six months, as the apparent conditions would seem to require, and generally have accompanied this statement with the request, "Shall this, then, be done?" In such manner this system became thoroughly established. The advantages are so

marked in the case of children that only by a similar method can the assurance of the preservation of the teeth from dangerous conditions be secured, and the same principle is applicable in a less degree only to adults.

The details of the method by which these appointments are distributed throughout the year are sufficiently simple. A book is kept, called the monthly index, in which months are printed on the margin instead of the alphabet. When the arrangement for the renewal is effected, the secretary enters the name of the patient at the proper month, with such symbols as may indicate the kind of appointments to be made at the new period.

The average amount of service required by each person when this system is faithfully and continuously carried out is nearly two hours, twice per year; so many requiring less than this as to give opportunity for those needing more to have the required allotment of time. With this apportionment three examination appointments made upon each day, with two subsequent appointments of one hour each, completely fills the available hours; stated in other words, seventy-eight patients per month, on the average, have their wants attended to, and are sufficient to fill all the time.

To meet the requirements of a full practice and to enable this system of management to be conducted, the employment of a secretary as an aid is an absolute necessity. The secretary should be a woman of good education, of refined manners, and of excellent tact. She should have some knowledge of simple book-keeping, be a good penman, capable of writing a courteous note in good language, and should, above all, be thoroughly systematic.

With such an aid dental practice is relieved of many of its burdens.

In addition to carrying out the system indicated, the secretary cares for the orderly arrangement of the instruments, prepares the filling-materials, and in various ways may be instructed to give assistance. All this is not an onerous labor to an orderly woman, and such service offers a function to women who shrink from duties of a more public nature, and who from choice or need of the income desire to be of use. I cannot too strongly commend the use of women secretaries to dental practitioners. Their services tend to the maintenance and development of practice, and are far more satisfactory than aid given by male students, whose intrusions may be a serious hinderance to the growth of practice, since women and children are sensitive to the presence of male assistants.

It will be seen by those of you who will carefully consider this system of governing practice, that while the practitioner appears to be a fixed factor, he is more satisfactorily provided for than if left to the control of circumstances. It is true he is in a great measure bound by what appear to be a series of established obligations to his clientele, but he has greater freedom within those limits than would be the case without similar order. The only hour which is an absolutely binding one is that for consultations. In reference to the other hours, whatever arrangements may be needed for the treatment of individual cases may be provided for, and in case the opening of an hour or the shortening of the day is needed to meet the requirements of health, there need be no reflection that one is neglecting his affairs.

This plan also allows those who are reaching the afternoon of life to lessen their labor and be free to enjoy whatever leisure they may require, and not lose any of the opportunities for practice, or appear to neglect the calls of their patients.

Heretofore I have considered only those features of practice management which concern the efficiency of the practitioner and the best interests of the patient. I have omitted any mention of the finances of the situation. As the nature of dental service is very exhaustive of nervous force and requires much skill to efficiently perform it, and the value and importance of our services to the people is great, we are entitled to high remuneration. But what shall be the initial rate? and how shall this be regulated? are serious and important questions.

The value of all material things is determined by the demand coupled with the ability of the people to pay for them. If the supply too much increases, or the ability of the people becomes impaired, the price diminishes. The same principle is applicable to a less degree only of professional services of every kind. It is the demand which at length determines the question of the income and, to a much less degree than in the case of goods, the ability of the people,—professional services not suffering in this respect in hard times nearly so much detriment as the affairs of the manufacturer or the merchant.

The same opportunity, however, does not exist for the abilities of the professional man becoming known as is the case in general business, and he has to await the occurrence of the fortuitous circumstances combined with the impressions of character which shall make capacity apparent, for the world shrinks from any one who, occupying a professional position, does by any direct effort

make pretension of ability, and resists with jealousy the attempt to make capital out of events, unmasking with dreadful cruelty the pretender.

In our specialty, notwithstanding the great demand for our services, it is peculiarly difficult to secure the attention of the public, for the reason that our ministrations are private and confidential, and do not attract general attention like the pleading and counsel of the lawyer or the cures of the general physician.

The thorough performance of duty, however, and the filling of all available time for whomsoever can be found to accept service, even if it has to be done gratuitously, will, if the person possesses the essential qualities, lead him into the upward path. But this consideration does not directly meet the question of income. Shall the beginner who has marked ability charge high or moderate fees? Had he not better accept the latter than restrict the opportunity for full employment by insisting on the former? For in full employment is the road to high income, because this cultivates ability, develops character, and gives the opportunity to bring one's services within the law governing the relations of supply and demand. Many of you must have in your minds men who, because of the knowledge of their own capacity, have restricted their commencement in life by high fees, and others whose high fees being out of relation to the demands for their services, have been badly stranded. The public is intelligent, and associates facts with considerable certainty; it may be slowly, it is true, but nevertheless certainly, and its voice is potent. While the public is jealous, it is also generous, and there is scarcely any limit in reason to the reward which will be given to those deserving its confidence.

The condition of one in full practice may become critical in consequence of the overpressure for service. When all the time is regularly taken and the demand continues, further demand tends to either one or both of two things,—the deterioration of the service or diminishing income. This latter apparently paradoxical condition requires relief. In my experience I have found only one remedy, which is to raise the fees to the new patient. This should be done by notice, and be uniform to this class. The action is essentially the same as that which is daily pursued in the business world; more is asked, and if the public will bid higher a new price is fixed. In the cases before us the result is not immediately reached. Should those subjected to the increased price generally return for treatment, the indication is plain that the service is enhanced in value, whereupon the increased rate can be made general

throughout the whole practice. In this manner the fees for dental services can be elevated from time to time without danger and in strict agreement with the laws which govern values, and no one is safe who goes much counter to these regulations. To be guided in the arrangement of charges for dental service by the arbitrary estimate of the value they may have in our mind, or by the assumed ability of the patient to pay, appear to be questionable principles of action. In the one case we are liable to be influenced by personal conceit, in the other we have yielded to the basest of motives, —the desire to have of the wealth of one person more than we cheerfully accept as a just rate from another person.

This brings us to the question, What shall govern the initial fee? What shall be the unit of charges? Shall it be specific for each kind of thing done? Should it be for the time spent? Or should it be an approximate standard of an hour's service?

I have held to the latter, but keeping time as the chief determining element. Given a patient of good quality,—that is, intelligent, healthy, teeth of good structure and not very sensitive,—a standard of an hour's service is easily made up.

Thus to a systematic person, whose mind goes before each action, and who, therefore, wastes no movements, an hour's service becomes a nearly fixed amount of dental labor performed upon the teeth.

The varying conditions and characteristics of patients modifies the amount of service which can be rendered in any given time, and when the physical and moral deficiencies of the patient limit our performance, he becomes responsible for the time expended without relation to the amount of service. Therefore, in these instances, the value of time becomes the cost of the service. In some cases it is impossible to render the half of a standard hour's service in one hour; in such instances the patient is justly responsible for a whole hour.

What, then, becomes of the standard denominated an hour's service? It is only of use to determine the relative condition of the operator. If he fail from want of tone to render an adequate amount of service in any given time, the charge should not be for the time expended, but should be that proportion which in his conscience has an approximate relation to his habitual standard of effort. This may appear complicated in its presentation, but should come within the easy comprehension of all engaged in full practice who are of methodical bent of mind.

There is, however, no rule so efficacious towards controlling the conduct of patients in the fulfilment of appointments, in their en-

durance of services, and other accommodating considerations, as the knowledge that they are responsible for the time which is being consumed.

It will be observed that this method of being remunerated for service is connected with and is a part of the system of the management of practice which I have presented to you.

It is easily perceived that the application of these principles of management are more applicable to operative dentistry than to a mixed practice. However, in my own, which is almost exclusively operative, what little of it is devoted to dentures is compensated for in the same manner. The different office services connected therewith are charged for at the same rate per hour as for other service, and whatever laboratory expenses are incurred are entered up separately with adequate compensative profit in addition. For operations strictly surgical in their nature, or in orthodontia, the fees should be determined principally by the character and importance of the cases.

These principles regulating compensation for service it must be conceded raises the question from that of "get what one can" to something like a degree of uniformity and more nearly into agreement with right and regard for the interests of others. It also brings the question of fees within the comprehension of the people; and if the above method or a similar one were in general use, I am inclined to believe it would not only remove the reproach which has been cast upon us by departures from what is right and just in these respects, and would, I sincerely think, raise the general compensation for dental service. It is also my impression that such a method would induce the diffusion of patronage among a larger number of those engaged in practice.

These methods are plainly better adapted to the conditions which exist in the larger cities. How far they can be brought into use outside the centres of population is a question which can only be determined by the sentiment which is capable of being developed in each neighborhood.

There may be details of the mode of carrying out this method of management, which will be elucidated during the discussion following the reading, but which could not with propriety be introduced in this paper.

CROWN- AND BRIDGE-WORK.[1]

BY FREDERIC A. PEESO, D.D.S.,[2] PHILADELPHIA.

THERE is probably no branch in the science of dentistry about which there exists a greater diversity of opinion than crown- and bridge-work, and there is certainly no one that has suffered more at the hands of unskilful and incompetent operators. Much has been written and said on this subject, both upholding and condemning it, and strong arguments have been adduced on both sides to prove either its great value or utter worthlessness.

A great many good dentists have been, and still are, strongly opposed to it, but this hostility is decreasing as the work and the methods pursued are becoming more thoroughly understood.

Crown- and bridge-work of the present time is very different from that of a few years ago, and as the people are becoming more enlightened on the subject, the demand for it is increasing, and the work becoming more thorough, and teeth and roots which but a short time since would have been condemned and extracted are now utilized as abutments for anchoring bridges and single crowns, and are giving a great deal more satisfaction than would have been the case had they been removed and plates substituted.

While some condemn the work altogether, others think that a single crown may be all right, or in some cases a very small bridge, but object to extensive pieces, claiming that they cannot stand, but will give way in a short time. If a single crown or a small piece of bridge-work will stand in the mouth, why will not a succession of crowns or an extensive piece stand as well, if the work be equally well done? If the work is used and not abused, it is one of the best things which can be done for our patients.

There is certainly nothing that can be done for them which will please them more, or give more lasting satisfaction, than a denture of this kind.

To most people the thought of wearing a plate is repugnant, but there will not be the same prejudice existing against crown- and bridge-work. It seems nearer to the natural teeth, and where the anchorage is sufficient it is more serviceable, and mastication is more thoroughly performed than it can be by the use of a plate.

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[1] Read before the Odontological Society of Pennsylvania, December 12, 1891.

[2] Demonstrator of Crown- and Bridge-Work, University of Pennsylvania.

There are unquestionably many failures in the work, and so are there in plates, but as in the case of the latter, a large majority of these failures can be traced to causes which it is possible to remedy, or which if avoided at the beginning, would have made the piece successful.

There are many causes for failures in crown- and bridge-work, the most important of which are insufficient anchorage, improperly-trimmed teeth and roots, poorly-fitted caps and bands, short pins, poor articulation, perforated roots, etc.

The first of these causes to be considered is the anchorage. If this is not sufficient, of course the whole piece is a failure, let the work be never so well done. It is impossible to lay down any rules concerning this, but I will mention a few cases where a serviceable bridge might be placed.

In putting in a full denture it is necessary to have at least four good teeth or roots to serve as abutments. By some this is not thought to be sufficient, but if there are two canines, strong and firm, and two good, strong, solidly set molars, they will carry a bridge for a great many years, and I should not hesitate to place one in such a mouth.

In a case of this kind, the canines should be cut off and Richmond crowns used, and not half caps, as half caps are not suitable for permanent work. If the roots were diseased and could not be brought to a healthy condition, of course there should be no thought of using them. Where the incisors are lost and the canines are standing, often a lasting bridge may be placed, always supposing the teeth strong and healthy.

If the canines stand well apart, and the incisors can be placed nearly straight across the mouth, it will make a strong piece, but if the arch is narrow, and the incisors have to be placed on very much of a curve, it is running a great risk to trust to the canines alone to carry it, as the leverage would probably be so great as to loosen the teeth. Where the six anterior teeth are lost, it is well to give up all thought of a bridge and trust to a plate. In most cases a durable piece can be made running from the canine to the second molar, and sometimes even to the wisdom tooth. The two central incisor roots will carry the two laterals, and the lateral roots the centrals. A loose root does not necessarily preclude the idea of placing a crown. In a great many cases it will yield to treatment and become firm. I have not time to speak further on this subject, but will proceed to the preparation of the mouth.

After being certain that the anchorage is all right, the most im-

portant part remaining is the trimming of the teeth and roots. If this is not done properly the whole piece is unsatisfactory and may be considered a failure. I do not think I am in error in saying that in three cases out of four this part of the work is not done at all as it should be.

It will be found that just enough of the tooth has been cut away to allow the passing of the band between it and the adjoining teeth, or if the tooth has broken down so that the band can be passed over, it is not trimmed at all. The cap is put on, and when it is pressed to position the edges stand away from the root or neck of the tooth, cutting into the gum, and being a constant source of irritation, often causing inflammation and loosening of the tooth.

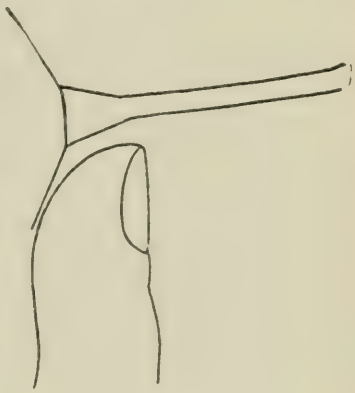
In trimming the teeth, the dentist should always have in mind what the shape of the tooth would be if cut across just below the margin of the gum. The swell should be entirely taken off to nearly one-sixteenth of an inch below the gum line, leaving the sides of the tooth parallel, or slightly larger at the neck, so that when the band is passed over it will hug the tooth closely and not impinge on the gum.

If you will take the trouble to trim a tooth out of the mouth, you will see that in shape it is very different from the majority of those you will see trimmed in the mouth.

Take, for instance, a lower first molar. Looking at it from the buccal side, the swell is very great; starting from just below the gum, it swells out, until where it touches the adjoining teeth it is often from one-quarter to one-third wider than at the neck. Looking from the anterior surface, the swell is not nearly so great, while the masticating surface is oblong. After this tooth has been properly shaped it will be nearly square, with the corners rounded, being slightly narrower at the distal side than at the mesial, owing to the distal root being smaller, and there will be about one-sixteenth of an inch between it and the adjoining teeth. (Fig. 2.) In many instances, after the mesial and distal surfaces are trimmed, it will be necessary to cut only the lingual, as the tooth often leans in towards the tongue, and after this side is cut away the band will pass over the enamel at the buccal side and touch the tooth below the gum. (Fig. 3.) It is often very difficult to trim these teeth on all sides with such wheels as you can get. Probably the most difficult place in the mouth to reach is the anterior surface of the lower molars. If you will take a thin mounted corundum disk and hold it over the spirit-lamp while the engine is running, and as the heat softens it a little press the edges outward, you will form a

cup-shaped disk which will do the work nicely. (Fig. 1.) For the lingual and buccal surfaces a small cup-shaped corundum will answer,—No. 11, S. S. White's corundums.

Fig. 1.



After an upper molar has been prepared, it will be found to be altogether different from the lower, being triangular in shape, with the base of the triangle at the buccal side and the apex at the palatal. (Fig. 4.) Of course this may vary at times, and the palatal root be as broad as the two buccal roots, but this is not often so. You will almost invariably find that this tooth has been trimmed about the same as a lower molar, without any regard to the shape of the roots, and that the band, while possibly fitting the tooth at the buccal side, is away from it at the palatal and impinges on the gum. In any of the posterior teeth it will be found that a great deal must be cut from the mesial and distal surfaces, but very little from the buccal and palatal or lingual. The cusps, too, should be ground away, especially where the tooth is to carry one end of a bridge, so as to allow a thick strong metal cusp to be placed on the band, and so form a strong attachment for the rest of the piece.

In making caps for any of these teeth, the band should hug the neck of the tooth tightly, and the contour should be restored till it

Figs. 2. 3. 4. 5. 6.

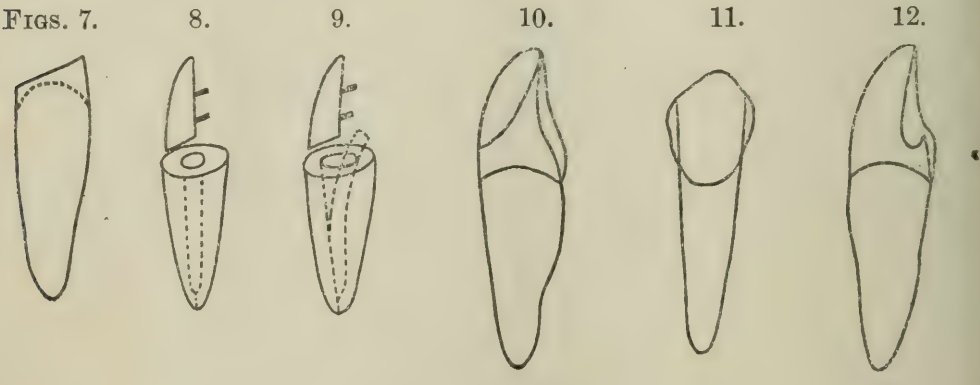


touches the adjoining teeth, so as to leave no space where the food may find lodgement and annoy the patient.

In preparing the teeth for Richmond crowns, the work is easier and more often properly formed, but here in a great many instances it will be found that the roots are not trimmed at all, or that the

work is not more than half done. After the tooth has been cut down to its proper level, if the enamel is taken off it will leave the root of the proper shape for the band to fit nicely, and it is very seldom that it will need any further trimming. (Figs. 5, 6, 7.) This will apply to any of the anterior teeth, or to any tooth where a Richmond crown is to be placed.

The preparation of the canal, too, has a great deal to do with the durability of the work. I think it is the general practice to enlarge the canal without changing its direction at all. In most teeth, if this is done, it does not leave room in front of the pin to place the porcelain without grinding it away or grinding the pin, and thus weakening it. (Fig. 8.) At times the pin is ground entirely off, and the only attachment it has is to the thin floor of the cap. If after having enlarged the canal you will lean the reamer towards the palatal or lingual side of the root, thus sloping the canal in that direction, by bending the pin slightly it will leave plenty of room in front of it to place the facing without weakening it in the least by cutting. (Fig. 9.)



Another prolific cause of weakness is short and small pins. No doubt all of you have been called upon to reset crowns which have become loose for no other reason than that the pins were too short or too small. I have frequently seen a cuspid or a central incisor crown having a pin not more than three-sixteenths or one-quarter of an inch long, and of No. 17 or No. 18 wire, where the root would easily have taken a pin one-half, or even five-eighths, of an inch long and No. 14 or No. 15 wire, and the strain on the tooth would require it. In opening the canal it is always well to ascertain the length of the root first by passing a very fine broach through the apical foramen. You then know just how far you can go, and can make the pin long enough and large enough to give all the strength

required. There are very few teeth that will not take a pin at least three-eighths of an inch in length.

Half caps and shoes form very questionable anchorages. They certainly are not suitable for permanent work, as the cement is sure to wash out in time, the piece becomes loose and will have to be reset, and, where the other end is firmly fixed, it is painful and annoying to the patient to have it removed.

I have a bridge in my own mouth that was placed in position two years ago, being anchored at one end with a half cap to the first bicuspid. It is still firm, but if it stays so another year I shall think it will have done all that could have been expected of it.

The strength and lasting qualities of the half cap depends perhaps more than any other on the proper shaping of the tooth. The usual method of trimming the cuspid is to straighten the sides of the tooth and grind away the palatal surface, and here the work stops. The cap is then made and cemented in position. (Fig. 10.) A bridge anchored in this way cannot last, as the force exerted in mastication is sure to loosen it by stretching the band of the half cap in front and forcing it inward over the basilar ridge. My practice is, and I think it is the only way to prepare these teeth, first to trim the sides so that they are nearly parallel. (Fig. 11.) The tooth may be a little wider at the cutting edge than at the neck, as the cap can be sprung over it. Then grind away the palatal surface until it is quite concave. The next cutting is the one on which the stability of the piece entirely depends, and that is the cutting of a groove longitudinally across the back of the tooth, just above the basilar ridge. (Fig. 12.) For this purpose a bur or small corundum wheel can be used.

For the benefit of any who may not have used the half caps I will explain how they are made. The impression should be taken after the tooth has been prepared. After running the model and having it thoroughly dried, cut the plaster away from around the neck of the tooth to nearly one-sixteenth of an inch below the gum line. (Fig. 13.) Then give it several coats of thin sandarach varnish, and after this has dried the model will be hard, and you can proceed to make the cap. First make the band the full height of the tooth, and contour its edges so that it will touch the plaster all around. (Fig. 14.) Cut it out front and back so as to leave these surfaces of the tooth exposed, letting the edges of the band at the inner side extend a little beyond where the tooth has been cut away. (Fig. 15.) Next take a very thin piece of pure gold or platinum of the right width, let it pass over the basilar ridge inside

the band. Burnish it carefully into the groove and up the back of the tooth, letting it extend over the cutting edge. (Fig. 16.) Then cover it well with hard wax, remove, invest in sand and plaster, and restore the contour with 18- or 20-carat solder. (Fig. 17.) With a half cap made in this way there is very little strain on the

FIGS. 13. 14. 15. 16. 17. 18.



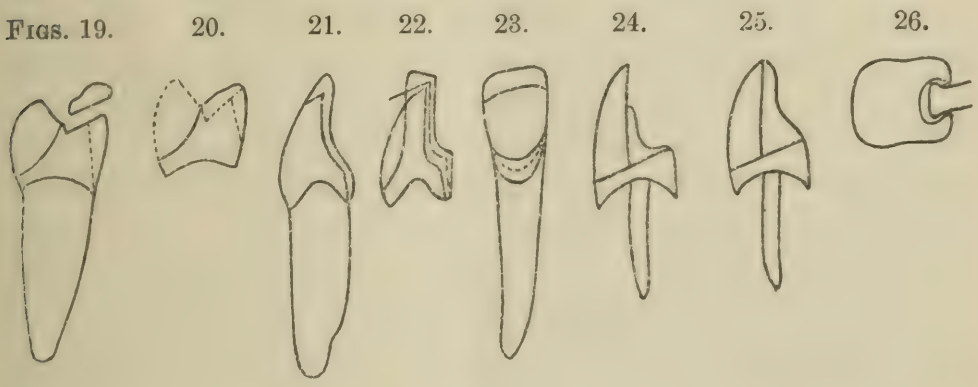
band in front, and it makes no difference how much pressure is brought to bear, it cannot be forced back over the basilar ridge, and the pressure is directly downward or upward, and nearly over the centre of the tooth.

In the preparation of the bicuspid the same principle will apply. The sides should be made nearly parallel, and the swell should be taken off the inner side of the tooth, so that the band will pass over and touch the tooth all around below the gum. The inner cusp should then be ground off, cutting straight downward at the centre, and sloping it upward towards the point of the cusp. (Fig. 18.) In making the band it should be cut out at the buccal side and even with the top of the inner cusp, as it has been ground. (Fig. 19.) The cusp is made by fitting a small piece of platinum to the band after flowing over it coin, or the same metal as the band, to the required thickness, and soldering it to its place (Figs. 19 and 20), and, as you will see, any pressure has a tendency to crowd the piece more firmly into position. (Fig. 20.)

The trimming of a tooth for a shoe should be the same as for a cuspid half cap, with the difference that the groove need not be so marked, and the cutting edge should be ground off sloping downward or upward towards the gum. (Fig. 21.) The ears of the cap should extend beyond the cutting edge as far as is necessary to restore the length of the tooth. (Fig. 22.) The thin metal over the back should be burnished carefully over the cutting edge, between the ears of the cap (Fig. 22), and this space filled with the same carat gold as the band. (Fig. 23.) It is well with any of the above to double the band in front, thus overcoming the danger

of stretching, and making the piece more secure. In trimming these teeth the labial face should always be left intact.

The use of the spud, spur, or bar, as it is variously styled, is advisable in very few cases, and it is a question whether it is safe to rely on it at any time. It should never be used unless it can be



made large, and strongly dovetailed into the tooth (Fig. 24), and then only on very small bridges.

A great many crowns are used without bands, but they are certainly not so safe as a well-made Richmond crown, and should never be used in bridge-work. The cement is likely to wash from under them in time, and they are far more apt to loosen than where the root is properly banded. Then, too, the danger of the root becoming fractured is another argument against their use. Fitting the band is often a somewhat painful operation, but it is quickly done, and the patient will soon forget it if the piece is satisfactory.

After the bridge or crown is completed and fitted in the mouth, the articulation must be corrected. A great many bridges, and a great many plates as well, are placed in the mouth which are really of no practical use, owing to the malarticulation. It will be found in most cases where teeth have been out for some time that those in the opposite jaw have elongated, and have grown so far out that they may touch the gums where the teeth are lost. In such mouths it is impossible to do anything for the patient without first cutting these teeth to their proper level. This is usually a very painful operation for the patient to undergo, and some may object to having it done, but to secure good results and do your patients the greatest possible service it is absolutely necessary to grind them away until you can secure a normal articulation, and the patient will have to bear it. I have never yet had a patient who would not allow me to do what cutting I thought necessary.

I remember one case where a bicuspid had grown out so far as to lock the jaws, and the only movement possible was simply the opening and closing. It was a question either of extracting or grinding away. I chose the latter, devitalizing and cutting the tooth to its proper level.

I removed some pieces of bridge-work this last summer that had been on but a few months, and which were made to accommodate such teeth as these. Of course they were of no use to the patient, but were a constant source of pain and annoyance, as the teeth were not trimmed, nor were the bands properly fitted, and the least forward movement of the lower jaw would throw most of the teeth at least one-eighth of an inch apart.

This work cost the patient twenty-five dollars a tooth. A large part of the bridge-work that is done is as bad, if not worse, than this, and is it any wonder that a great many cry out that bridge-work is a failure?

I removed these pieces, trimmed the teeth as I thought they should be trimmed (although the patient winced a good deal), and put in others, and certainly nothing could be more satisfactory than that work is at the present time. I do not believe in grinding away more than is absolutely necessary, but it is a great mistake, whether putting in a plate or a piece of bridge-work, to let your dislike for cutting the natural teeth or pity for the patient deter you from doing what is really for their benefit.

It may be well to mention one other cause of trouble, and that is the breaking of facings. A great many times this is due to short backings, letting the porcelain extend away beyond the gold, and leaving the whole strain on the pins. (Fig. 25.) If you will let the backings extend to, or just beyond, the cutting edge of the tooth, and then flow solder well up to that point, it will make a stronger piece, as the force of the bite will come partly on the metal. (Fig. 26.)

The last, and a very important operation, is the cementing of the piece. As you are all, probably, more or less familiar with this part of the work I will say very little about it. The piece and teeth, or roots, should be as thoroughly dried as possible. Cement should be put well up into the canals and in all of the caps, and the bridge or crown forced quickly into position. It is well to use plenty of cement, and as the bridge is pushed to its place, the excess will be forced out around the edges of the cap. It is the custom with some to drill holes in the cap to allow the surplus to escape, and then fill these holes with gold, but this is a great

mistake, as the caps should be perfectly tight, so as to force the cement to every part.

Now, a few words about working on the model. For this purpose the hardest plaster obtainable should be used. I have given directions about preparing them while speaking on half caps. For all full gold or half caps, I think that the work can be done better and much easier on the model than in the mouth, and certainly it is far more agreeable to the patient. Where you intend to put on a Richmond crown, with a part of the tooth cut below the gum, it is, perhaps, easier to fit the band on the root.

There may be some who doubt the possibility of doing as accurate work on plaster as on the tooth, but you cannot tell what can be done until you have tried it yourself or have seen others do it. I did not think it could be accomplished until convinced of it by Professor Essig, of the University of Pennsylvania, from whom I learned what I know of model work. It certainly requires more skill and care, but after having mastered it, you will work in the mouth only when it is unavoidable.

Where a cap for a Richmond crown is made on the root, if, after taking the impression, a little soft wax is flowed around the inside of the band and on the pin, it will not be necessary to run the model of sand and plaster, but plaster alone may be used. After the cast has become hard, the cap may be taken off with a pair of heated pliers, and the wax burned away. It may then be replaced, and when the crown is ready to invest for soldering, it can easily be removed without having to be cut out, and there will still remain a perfect model on which, if it should be required, another crown could be made.

A volume remains to be written on this subject, and this paper but touches lightly on a few of the most important points. It is essentially a work of details, and it is by giving careful attention to these that the whole is made a success. Where the conditions are favorable and the work is thoroughly done, it is one of the very best things that you can do for your patients. Where the reverse is the case, it is one of the very worst, and the mouth might better have been left untouched.

ON THE VALUE OF CRYSTAL GOLD IN DENTISTRY.[1]

BY N. W. WILLIAMS, D.D.S., NICE, FRANCE.

Crystal gold was first brought to the notice of the profession as early as 1855 or 1856. In the winter of 1856 or 1857 I was attending my first course in the Ohio Dental College, at Cincinnati, and Professors George Watt and J. Taft had invented a form of crystal gold which they exhibited before the class, filling a number of teeth to demonstrate its superiority over gold-foil. Professor Taft built up for me before the class a superior molar, broken down on three sides to the gum, with this new gold, and it was considered a wonderful operation, as this was before the days of the advent of the rubber dam and the mallet, and all of the other aids to operative dentistry which we now possess. This filling was one of the wonders of the day, and it had to be exhibited at all of the associations for years.

This form of gold was made after what is called the mercury process, which consists in dissolving pure gold in one part of pure nitric acid to three parts of pure hydrochloric acid, and the gold precipitated by slowly adding a strong solution of sulphate of iron and letting it stand undisturbed for about twenty-four hours, when the gold may be found in the bottom of the vessel in a brown powder. The solution is carefully poured off and the gold is poured onto a flat dish and pure sulphuric acid added, sufficient to cover the gold, and allowed to stand for a few hours to get rid of any iron which may be present. Then the gold is washed with several workings of distilled boiling water until no taste of acid remains. It is then allowed to dry until all moisture disappears. It is placed with pure mercury, a little at a time, in a wedgewood mortar and ground together until it is a thick paste, when it is again washed with hot distilled water until the water remains clear. It is then placed in an evaporating dish, a steam bath, and dilute nitric acid added to cover the mass, and watched closely until all of the mercury has been driven off, which leaves the gold in crystal form. This is washed with distilled hot water until no taste of acid remains. Then the gold must be placed on a soapstone slab and put into the fire and slowly heated to redness, which drives off any impurities and anneals it, and it is then fit for use. The process being

[1] Read before the American Dental Society of Europe at Heidelburg, August 4, 1891.

somewhat difficult and complicated and attended with some danger to the health, the inventors were never able to make it in sufficient quantities for sale, and the profession were deprived of a very valuable aid in operative dentistry.

Becoming associated in practice with Professor Watt in 1865, we continued to make it for our own use during the seven years of our association, and I have never, before or since, filled teeth with such satisfaction to myself and patients. After coming abroad to practise, I did not have the same facilities for its manufacture, and I was forced to resort to the hard work of making fillings with gold-foil.

The crystal gold, known under the name of A. J. Watt's crystal or sponge gold, was brought out about the same time as that of Watt and Taft. At first it was not a success, as complaints were made that it discolored in the mouth, and did not make a perfect filling at the margins. This may have been due in part to bad manipulation, for, being very spongy, one was inclined to use it in too large pieces, and it then would harden under the instrument before it was condensed throughout the mass. The makers of this gold have steadily improved it until now it is a very valuable gold in saving teeth.

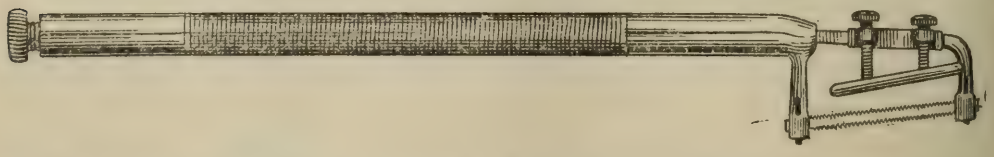
Of late I have been using it *in connection with gold-foil*, and I find they work well together, and are a great help one to the other. My method consists in placing some soft gold-foil, either in the form of rope or cylinders, against the wall or part of the cavity where I am to begin my filling, and then with the pliers take up a piece of the crystal gold sufficient to cover the foil, and hold it in the flame of the spirit lamp until it is heated to redness, then place it against the soft foil, and with the mallet drive it home at the same time with an instrument in the left hand, holding the soft gold in position until the first piece is perfectly condensed. Then I proceed in the same manner until all of the walls are covered or lined. In using the soft foil against the walls it takes the form better than if it were annealed, and makes a better filling, while at the same time, the crystal gold being hot, it sufficiently anneals the soft foil at point of contact to cause the two kinds of gold to perfectly unite together. After all the walls are covered, and the soft foil having been allowed to come up to and cover the margins, I proceed with the filling, using alternately the crystal gold and foil, but annealing or heating each piece of foil, as well as the crystal gold. When first beginning this method of filling I used little balls of loose cotton-wool, which I placed against the soft foil, and with the

plugger and the mallet would drive the soft gold against the walls. This leaves the cavity beautifully lined with gold. But I found the crystal gold answered the same purpose, and the lining was not so apt to become displaced. In very deep cavities and under-cuts the cotton I find very useful in getting the gold where I want it. I always try to have the last layers of gold in the filling to lie with the crystal gold and condensed with instruments with fine serrations, as there is no gold yet discovered that makes so hard and fine a finish as the crystal gold. I feel quite confident that any operator, after a few trials, will be convinced that crystal gold has a value in dentistry that is not generally appreciated.

SAW-FRAME AND GUM-GUARD.

BY DR. W. H. ROLLINS.

The little saws we use about the teeth are perforated at the ends for the passage of small pins which hold the saw. On this account these saws are very weak and break constantly. The object of the frame to be described is to overcome this difficulty and to furnish the means of using a saw when broken. By means of the milled head the distance between the jaws of the frame



can be varied to suit the length of the saw. Each of the jaws is perforated for a slot through which the saw passes and by a hole for the insertion of the little pins which hold it. To adjust a saw, remove the pins, put it in place, arrange the jaws to the right length, then press in the pins, which, bearing against the saw laterally, press it so firmly that it cannot get out. It is necessary to remove the temper from the saw at each end for an eighth of an inch, so the pins can dent it laterally in order to hold it firmly. I recommend the use of short saws, and find that three-quarters of an inch is the longest distance which the jaws should be apart, so I have directed Messrs. Codman & Shurtleff to make the frames to open this amount. The milled heads on the gum-guards are to turn the guard up and down, to adjust the frame so the saw cannot plunge into the gum.

Reports of Society Meetings.

NEW YORK ODONTOLOGICAL SOCIETY.

A REGULAR meeting of the New York Odontological Society was held Tuesday evening, November 17, 1891, at the New York Academy of Medicine, No. 17 West Forty-third Street.

The President, Dr. William H. Dwinelle, in the chair.

The President.—Gentlemen, we are fortunate in having for our essayist this evening one of Philadelphia's most prominent practitioners, who will take us into his confidence concerning the rules and regulations he has formulated for the government of his practice.

I take pleasure in introducing Dr. Louis Jack.

(For Dr. Jack's paper, see page 81.)

DISCUSSION.

The President.—Gentlemen, Dr. Jack's address is before you for consideration. We would like to hear from Dr. Howe.

Dr. Howe.—The presentation of the subject has been such that I have no doubt, as the discussion proceeds, it will be more efficiently dealt with than I feel adequate for this evening. In one sense there is nothing of more importance than that we should learn order; to husband our physical resources, make the most of ourselves in our practice, and make the most we can of our practice. I think Dr. Jack's presentation of the subject has been so forcible that it must have impressed itself upon the minds of all present. I feel that some of the methods presented will be of great service to me. I would like to ask Dr. Jack to explain a little more fully the use of what he calls his monthly index. If he can add a word or two on that subject, and allow the book to be passed around, I think we would all learn something from that. It was not quite clear to me how it was to be used.

Dr. Jack.—To make this subject clear I will state the routine of the moment when a series of cases are completed. The statement is made to the patient that an appointment for examination should be renewed at a proper period, and the question is distinctly asked,

Whether this shall be done? This is because at one time when such an appointment was sent, the patient replied by returning the card accompanied by his personal card, on which was written, "Mr. —— has no appointment with Dr. Jack." The cut was so keen that the language of the examination-card was changed to read, "Mr. or Mrs. —— has, in agreement with previous arrangement, an examination appointment at ——." It is seen the card carries the agreement on its face. The above arrangement is carried out by the secretary entering the name, address, and kind of appointment required on the monthly index at the proper place. In this manner, as the time passes, the names of nearly all the regular patients find their places on the monthly index, and without much effort the preliminary engagements become evenly distributed.

As the time approaches, the appointments are carried forward into the engagement-book, from which the notifications are made a week in advance of the date given.

As there are six hours of each day allotted for operative service, it will be observed that three appointments for examination will be sufficient to fill completely the time, if to each patient is given two single-hour or one two-hour engagement, therefore about eighty persons arranged for any given month occupy the whole of the time. When patients are periodically examined and the cases carefully attended to, the average service required by each one becomes less than two hours twice per year. Some may require nothing done; some one hour; others several hours. Upon this average the whole arrangement and allotment of time is based.

Dr. Northrop.—In making those appointments, you say, "Within three or six months it will be necessary to make an examination of your mouth," and you enter it on your book. Is it simply for an examination, or do you make provision for further time?

Dr. Jack.—As I have stated, we make other appointments on the book. There are, however, some persons who rarely require operations, and the memorandum then will call only for an examination.

Dr. Northrop.—At the time you finish, you consider their teeth in perfect order, and yet you say they should have their mouths examined. Do you anticipate further trouble, or is it done merely as a precautionary measure?

Dr. Jack.—It is assumed that the large majority of people require some service each six months and some persons even more frequently.

Dr. Northrop.—You anticipate that two hours is sufficient?

Dr. Jack.—That appears to be an approximate average, and is

in agreement with the statement I made this evening, that three examinations each day, and six one-hour, or three two-hour appointments fill out the day. No patient is allowed at the same time more than two one-hour appointments, or one two-hour appointment; but if they have much service to be performed, they are placed upon an emergency list, which the secretary keeps, of people who need much service. Such persons, also, have the advantage of receiving the hours which may be opened.

Dr. Kingsley.—I should like to ask Dr. Jack in reference to charging for the time of examination?

Dr. Jack.—I charge for the examination according to the time occupied.

Dr. Kingsley.—Suppose it be fifteen minutes?

Dr. Jack.—My usual time is ten minutes. Sometimes it requires twenty. If I cannot thoroughly examine a mouth in ten minutes, the remaining portions are noted, and the examination is completed at another time.

Dr. Kingsley.—And that charge is one-sixth of an hour?

Dr. Jack.—It is; I invariably charge for the examination appointment. In the front of the book will be found the different forms of stationery that are used. A page of the chart-book of examinations, which is kept before me each day, and the day slip, which my secretary makes out in the morning, with the names of the patients upon it, opposite the given hour. This slip is kept behind me on a lectern, and, as I get through with the case, I mark what I have done, and the symbol of the charge. These symbols are carried forward by the secretary into the appointment-book, and become the first entry. Another form will also be found which is for the use of any one who may happen to call and not be able to get my attention, or who may come at a time when I am absent. The person fills out this slip with an expression of his wants.

PLEASE WRITE BELOW—NAME, ADDRESS, AND PURPOSE OF CALL. THE MESSAGE WILL HAVE EARLY ATTENTION.

Name,.....

Address,.....

(Purpose)

Dr. Jarvie.—I would like to ask Dr. Jack, as he reserves only the hour between twelve and one for examination and short treatments, how he attends to children who are at school during the day, and men who are at business, as it must be inconvenient for them to call at that time?

Dr. Jack.—I have carried on this system so resolutely and for so many years that my people have all fallen into the habit of it. They know they cannot see me except at a certain time, and the overpressure has been so great that I do not care to be troubled by people who will not conform to the regulation, which is in the interest of all concerned. I would say, however, that if any one should come to my office in pain, I must find relief for them, as this is a necessity which knows no law. I then ask to be excused from my patient to give the necessary relief; but when a practice is conducted in the manner presented, it is of comparatively rare occurrence that any one will appear in great suffering. The ordinary inconveniences can be deferred by any one until the hour of twelve-thirty. The hour from twelve to one is divided, the first half of it into appointments for examination; in the other half of it small appointments are made, and, as I have stated, unavoidable calls are received, which leaves half an hour, from one to one-thirty, for rest and lunch. Occasionally the time for lunch is taken away by the necessity of attending to some patient who may call at twelve-thirty in a condition requiring immediate treatment. This, however, is one of the incidents of the life of every physician.

The President.—I feel as though I could hardly forgive Dr. Jack for not reading me his lecture fifty years ago. Dr. Jack's address is a very fine exemplification of Milton's saying that order was heaven's first law. Are there any further remarks? Dr. Jack is very kind and communicative.

Dr. Jarvie.—In my own practice cases occur which I term "emergency cases." For instance, a tooth is broken, or some accident has occurred that demands immediate or almost immediate attention, and perhaps requires considerable time. I do not quite understand whether Dr. Jack fills his book so closely as to leave no room for this class of cases.

Dr. Jack.—My book is generally filled very far ahead. Those people you speak of generally come at twelve-thirty. They are unavoidable calls. If a person comes suffering, I always attend to him.

Dr. Jarvie.—I mean such cases as this: A person, in biting a chocolate caramel, the other day, broke off a lateral incisor. A few

minutes would not be sufficient to attend to that, and yet it must be attended to immediately. The patient must be relieved of the deformity within twenty-four or forty-eight hours. Do you put one of your other patients off?

Dr. Jack.—I will answer that. I might state that even when one endeavors to keep all the time actually filled, the appointment-book is constantly changing. The secretary watches for those changes, and she keeps a list of people with whom to fill opened hours, so that the book, while it may be filled far ahead, is not so inflexible as may appear, because there are circumstances which compel people to consider our appointments of less importance than some other things to which they have to attend; but the immediate want, if it is a case of suffering, is attended to then and there. If the tongue is being scratched, the chisel is used, even if it delays an appointment or takes from me my rest and lunch.

Dr. Jarvie.—The question in my own case is how to relieve myself of the great pressure from a superabundance of patients and at the same time to do justice to those for whom I work, by not being called away from operations any more than is absolutely necessary. I have not, however, adopted such a rule as Dr. Jack has.

It may be owing to the situation of the large village of Brooklyn, but I find that I have the most calls when gentlemen are on their way to business in the morning, and directly after the schools are out, and I do not know what I would do with my school children, if I did not see them at that time. Such an arrangement as Dr. Jack describes, with the aid of a secretary, relieves one of a great amount of labor, and as it is a service that can be done just as well by some one else as by the dentist, that time is saved for him to make operations in the mouth.

I do not think Dr. Jack is wise in one particular; he sometimes goes without his lunch. I never do that, and it only goes to prove that one can arrange his time if he so wishes. I think sometimes my time is about as much occupied as any one's can be, and yet I do not vary more than five minutes in taking my lunch at one o'clock, and from one to one-thirty I am not to be seen by any one. I am away from my office to all intents and purposes, as far as my patients are concerned. That half hour is mine, and I find that by doing so I keep myself in much better condition than I otherwise could, and it is necessary for a dentist to be in good condition all the time to do justice to his patients. It is a very important question to a dentist how he may economize his time so that he may

earn the more in the seven or eight hours that he has to work, and that his patients may be subjected to the necessary discomfort or pain as short a time as possible, and it would seem, from what we have heard to-night, that Dr. Jack has solved that problem in the best interests of both patient and dentist.

Dr. Hodson.—I would like to ask Dr. Jack what course he pursues with patients who are late in keeping and forgetting appointments, or not keeping them through inability,—whether he charges his full fee, and in case of any change of appointment, how much time he requires?

Dr. Jack.—I would state to the gentlemen present that I almost invariably charge for losses of time. I do not charge for the loss of time by the breach of an examination appointment, because there have been instances in which patients have taken that roundabout way of ceasing to continue my services, and for that reason I have not been in the habit of charging for the loss of that time, and also because this hour is filled by the various calls, and therefore there is no actual loss. For regular appointments for service which are broken a charge is usually made, unless notice is given, and that charge I might state is not always for the full value of the time, though in the large majority of instances I charge what may be called the *cost* of the time. The cost of the time is one's annual expenditures, divided by the number of working hours in the year, and if this be charged, the loss of that hour is not a deduction from the other hours of the year. Sometimes, however, the failure to keep an appointment is of real benefit, as the time may be used for needed rest; but in the large majority of instances, the loss of an hour is more than the loss of the whole value of the time, because it impairs one's morale by breaking up what may be called the "working spirit" of the day, and the whole day may be impaired by the loss of an hour in the morning. One can hardly define what that influence is, but it is a potent one, and most operators must have frequently experienced it.

Dr. Hodson.—Dr. Jack forgot to answer how long previous to the appointed time he requires notice of change, and I would be pleased to learn whether he charges for appointments broken unavoidably.

Dr. Jack.—On my cards I state "reasonable" notice. Every properly-constituted person will give such notice as would enable one to fill the hour. If a man should send me five minutes notice, I would charge him as much as my conscience would allow; but if I am given one hour's notice, I try to fill the time. The usher is

sent out to people whom we have near us, who would be willing to come at any time. If there be two hours' notice, then it is not difficult to fill the opened time.

The President.—We would all like to hear from Dr. Perry.

Dr. S. G. Perry.—I think it is evident that I was justified in urging Dr. Jack to write on this subject. Perhaps in no way can I discuss his paper so well as by relating my own experience and describing my method of conducting my own practice. If there has been any order or system in my office, for many years past, I think I may say I am indebted mainly to Dr. Jack for it. I have been fortunate enough to know him for many years, and I have adopted many ideas which he has explained here to-night, and have found them of great benefit to me. In some respects I have carried them as far as he has; in others, not. Many years ago he kindly sent me a book for recording the names of patients to be sent for, such as he has shown here this evening; but I confess I did not have the courage to fully carry out the plan. I found it to be more burdensome than I expected it would be, and finally abandoned it almost altogether, feeling that I must, after all, put the responsibility of returning for examinations upon the patients themselves. Yet I now have, and have had for years, quite a large number of patients whom I send for regularly for examinations. They are known to my secretary, and are sent for without any effort on my part; but when it comes to sending after all my patients, as I presume Dr. Jack does, I have receded from that. The matter of keeping an exact chart is one which interested me greatly when I began practice, and for many years I made an exact record of every operation I performed, including temporary ones, but within the last few years I have reduced the number of charts kept to those of more important operations, and operations on the roots of teeth, as well as the conditions of teeth where the pulps are nearly exposed.

In the matter of organizing my practice so as to make the most of every moment, I adopted years ago Dr. Jack's system of asking persons to come at certain times for examinations, consultations, etc. My hours for that purpose are from twelve to one and from four to four-thirty. The last-named hour is for children who come from school, and for business-men. But the hour from twelve to one is given over more generally to the public. It has come to be known as the hour when I can be seen, and it is not uncommon for patients to come long before that hour in order to be first. There is more nervous wear and tear on the system in these consultation hours than in any other. I aim to make these consultations prove

profitable, for while I do not make a charge for a patient who comes in for a moment or two, if they sit in the chair for several minutes, I feel justified in charging them for it. I try to get my luncheon at one, but it is oftener a quarter past one. The first afternoon patient comes at one-thirty, and I try to be on time to the minute. We live in a hurried age, and more and more does the question of economizing time become of importance; no people think their time is of greater importance than those of New York City, and there is probably no place where the practice of dentistry is as hard. I can only say in the most emphatic terms that I have been under great obligations to Dr. Jack for encouraging me to adopt his plan of asking patients to come for consultations only at a fixed hour, because it has given me for the working hours between nine and twelve and half-past one and four that peace of mind which can never be known in any other way. I think I should have broken down before this, but for having the courage to say that I cannot be interrupted between nine and twelve or from one-thirty to four. I adhere to that almost invariably.

In a case of pain, however, I see a patient promptly, as that is a necessity that knows no law. My secretary and a maid are always on my office floor. The maid attends the door and ushers patients in and out of the operating-room, the secretary assists me about the chair, takes charge of my instruments, and writes my letters from dictation. I try to be very strict, however, about dictating while at work. For many years I have realized that there are few patients who will tolerate the distraction of attention that will come from dictating letters while operating. There are cases of children and others where one's own tact will tell him that he is justified in carrying on a double action of the mind; but there is great danger in it, and I try to avoid the danger. Without the aid of my secretary and occasional dictation, I should be almost stranded. I seldom step out of my office from the time I go there until I get my lunch. It is the maid's duty to ask the patients in and usher them out. It is the secretary's duty to make the appointments. I say to her, "Give this patient half an hour," or an hour, as the case may be. This is done in another room, leaving the office free for the next patient. The length of time given is invariably written out on the appointment-card and in the appointment-book. I never make an appointment, rarely see my appointment-book, and almost never know who comes next until the door is opened and the patient is ushered in. There is always a list of waiting patients to be sent for, and if a letter or telegram comes

stating that a patient cannot come for a certain hour, it is easy to send out for one to fill the place. It is not often, therefore, that I have to charge for lost time, but sometimes I do.

It seems to me that this question of systematizing and economizing one's time is of supreme importance; there is no question that should be studied and kept before the mind as this should be. It is due to the dentist, to his family, and to the patient. One cannot perform good service if he is often disturbed. I know of nothing that will injure a dentist so much as to leave a patient in the chair, and go out to attend to other business; and I know of nothing more destructive to the temper of patients than to have the rubber dam nicely adjusted, and then have the operator called away to discuss the question of the origin of the universe and the natural tendency of things! I notice patients are more and more jealous of time. Even little children have their engagements,—their dancing classes, their French, their German, and classes of all kinds. Ladies have their engagements at lectures, in classes, for music or for various other things. It is a telegraphic, electric age, and one must be most prompt and exact in all they do. Above all, one must be faithful in keeping appointments with their patients. I have my instruments in such a condition that they are always ready for use; many are numbered and placed in numerical order. After being used for one patient, they are cleansed and sterilized, so that there is always a bright and new case of instruments for the new patient. My secretary is so efficient and orderly that I can find without an instant's loss of time just what I want. Every instrument is polished and in perfect order and in its proper place. That gives me more mental comfort and more courage than anything else about my office. I think it has a good effect on the minds of the patients also. If a dentist's shoes are not well blackened, and he be not neatly dressed, patients will give him the credit of being untidy; they will say if he does not do things neatly generally, he will not be likely to do nice dental work. I believe that applies to all one's surroundings. Ladies who know nothing about dental operations can instantly tell if the rooms are well kept, and if the operator works with system and order.

Dr. Howe.—What did Dr. Perry mean by saying it was dangerous to dictate while one is working?

Dr. Perry.—The danger is that of making a bad impression on the patient, who will mentally say, "I would rather have him thinking about my work. If he would not worry about his letters he would be more careful. He is getting near the nerve; he will

be on it in a moment!" There is nothing so effective in the management of a dental practice as to feel for the patient; to put yourself in his or her place. And particularly is this true of little children,—bless their dear little hearts! Self-abnegation at the operating-chair will attract and hold patients to that extent that life will in time become a burden. If real sympathy lies deep and warm in the heart of the operator, it will invariably be felt by the patient, and without the use or waste of idle words.

Dr. Kingsley.—I was unfortunate in not hearing the beginning of Dr. Jack's paper, but what I did hear was certainly filled with many admirable things. There is one thing particularly that I should say amen to, and that is where he pays tribute to a competent secretary. He has only changed the language of my own views as I expressed myself on that very subject about ten years ago. I think I was the first one who had ever paid the tribute that is justly due to a lady secretary. I have never changed my mind. I would emphasize it more strongly if I could, and I was much gratified at hearing Dr. Jack use exactly the same ideas.

There was a matter with reference to which I would like to talk. I do not know whether I misunderstood Dr. Jack or not, but I believe he said he bases his charge for operations upon the time employed. I once thought the same way, and I thought it was not only a good thing but the best thing; that if I gave my time for one hour I must be paid for one hour. And so for years; but by and by I began to recognize that I was doing a great many more important things for some patients, which caused more strain upon my brain than in another hour, and that the value of the service was not to be measured by the length of time expended upon it. I gradually began to think that I was degrading my profession to the level of a day laborer, charging for so many hours a day, or for so many parts of a day, per hour. To-day I read of a strike among the scene-shifters of the theatres, which had been compromised upon a basis of fifty cents an hour. I thought to myself, Why, this is exactly what I used to do, only I did not charge as low as fifty cents an hour. I thought, when Dr. Jack was reading his paper, Is all of dentistry filling teeth by the hour? Because, then, it comes to the mechanical operation of stuffing metal into a hole in the tooth per hour. Is that all there is of dentistry? We know it is not, and if it is not, the system is a bad one. Again, I think Dr. Jack conveyed the idea that it is hardly fair to charge one person one fee and another person another for what appeared to be the same work. That is the true commercial idea,

of course. If I go to one store and buy a yard of Merrimac print for nine and one-half cents a yard, and another person buys the same print at my elbow for nine cents a yard, I complain. It is not fair. That is the commercial idea. But does it apply with us? I do not think so. Some time ago I had to treat one of the family of a lawyer who, to my personal knowledge, had received, for what seemed to me a limited service in his profession, fifty thousand dollars for his fee. In another case he had received a great deal more, and in many other instances probably a great deal less. The case required regulation of the teeth, and it was carried on—no matter how long. When the work was completed it was important in that the child had received a great deal of benefit, having been actually deformed before; now she was re-formed,—that is to say, the deformity was entirely removed, and the whole expression of the face was changed. The value to the child and to the parents was undoubtedly very great. The work performed had been one of only such strain upon me, so far as my inventive faculties were concerned, as a great many other things for which I have received only a very small fee. When the work was completed I sent in a bill. I had never seen the father. I sent in a bill which was more than twice as large as any fee I had ever charged. My secretary said to me that I was making a very grand mistake. I said, "How so?" She answered, "Because you never have charged before any such fee for the length of time devoted to a similar performance." I said, "No, I have not; but I know the father of that child is a professional man; he looks at the service I have performed from a totally different stand-point from a man who is a laborer, or who is selling calico at a profit of ten per cent. upon the cost. He looks upon the service as a professional service which involves brain work, and looks upon it as a valuable work, too. When he makes a charge he makes it from that stand-point. My brains are worth as much to me as his are to him, and I intend to view this thing from his stand-point,—from the stand-point of a professional man." A few days afterwards the gentleman's card came in to me. He greeted me most effusively, and said he wanted to come in a long time ago to thank me for the great service which I had rendered his child. That no amount of money could compensate him for the pleasure I had given him. There was a check, and also an appointment from him which brought me a large amount of money. Gentlemen, you say it is all right to take all the operations in dentistry on the same plan? Dentistry is not simply plugging teeth with metal fillings and polishing them off, and charging for a day's labor.

It is something more than that, and, when it is, that should be taken into consideration.

Dr. S. C. G. Watkins.—This is certainly a very enjoyable meeting. It seems a most important factor in the life of a successful dentist that he should be able carefully to economize his time, and handle easily patients of different temperaments. This is a life-long study for any dentist.

Much has come home forcibly to me this evening, and I feel that if we were able to carry out the principles presented in this paper we would all live longer. The doctor has worked his practice up to so extreme a point, as regards the economy of time, that few of us can expect to attain to it. In my practice, and perhaps in that of the majority, I presume it would be altogether impracticable to follow Dr. Jack's methods in every particular, but he has given us many valuable ideas, and for every one we are able to adopt benefit will come, I am sure.

Dr. Northrop.—I do not know that I have anything to add to what has already been said. I think the saving of time to a dentist is a great consideration, and the person who can save time saves his strength. I was very much pleased with Dr. Jack's paper. I was in Dr. Jack's office a number of years ago, and appropriated some of his ideas. As the result of that visit I have taken the hour from twelve to one o'clock for examinations and consultations, and from one to one-thirty for my lunch, and since this innovation I have had my regular operations broken into probably as little as any other man, and I think I have been able to do more work than I did before. I recollect very well, before I went to see Dr. Jack and learned how he divided his time, I had, on one occasion, a patient who had an appointment for an hour and a half, and because of the frequent calls and interruptions, I was able to give only about twenty minutes labor to that patient. The rest of the time was lost. I did not complete the operation I intended, and I was disappointed. Since I have made the above change it has been greatly to my satisfaction, and I think to my patients also.

Dr. Brockway.—There is one aspect of this question concerning the conduct of practice, of which I will speak, as it has been alluded to several times,—that is, the control of patients and getting them to do as we wish. I am satisfied that such men as Dr. Perry or Dr. Jarvie, or others who have spoken here, can do just what they please with their patients. The world is full of people who want the services of these men, and they are willing to make almost any sacrifice to secure such service. They will come if required to on

certain days of the year, or on any hour of the day, or of the night even. These patients cannot be driven away by any rigidity of rules regarding the conduct of practice. I have listened to Dr. Jack's paper with a great deal of interest, and I only regret that he had not written it years ago. The matter of economizing time is of the first importance. That is where so many dentists fall short. They have enough to do, but their time is so broken into and divided and frittered away by lack of system and order that at the end of the day they find they have accomplished very little.

Dr. Perry.—Here is a little device which Mr. Hodge brought to me from San Francisco,—a device invented by Dr. Hatch, and which I have used for some time,—for holding the rubber dam on the labial and buccal surfaces of the teeth. It opens and closes by turning a screw, and it will stay firmly where it is placed. The two points of bearing are opposite each other. My associate, Dr. Woodward, with his usual ingenuity made some changes in this device, by which it is possible to easily change the points of bearing fitting it for use on teeth from which the gum has receded on the buccal and lingual sides. There are three of his devices here; two are quite alike, and the third one, which has the same idea in the main, has some slight modifications. It has three bearings, like a three-legged stool which will stand evenly on an uneven floor. The adjustment can be made so that the device can be held perfectly steady. The points of bearing can be made directly opposite each other, or it can be opened so as to have the points of bearing very far from being opposite. This little device I consider now to be almost invaluable. I should hardly know how to get on without it.

A unanimous vote of thanks was tendered Dr. Jack by the Society.

Adjourned.

S. E. Davenport, D.D.S., M.D.S.,
Editor New York Odontological Society.

AMERICAN DENTAL ASSOCIATION.

August 6, 1891.—Third Day.—Morning Session.

Meeting called to order at 9.45. The president in the chair.

Dr. Marshall's paper, "Pyoktanin Blue in the Treatment of Cancerous Growths," was discussed as follows:

Dr. Waters.—In order that there shall be no time lost, I will say

a few words, as I have had a little experience in the matter. I chanced to meet with a case where there was a very offensive odor, and I asked the patient if he had been under treatment, and he said yes, for cancer. He had no one treating him then, as no one had succeeded in helping him any. I asked if they had ever relieved the odor, and he said no. I told him I thought I could remedy that. He said if I could do it, he would be very grateful. He came to my office, and, thinking that I would like to have the advice of another physician, I took some of the waste matter of the cancer between two glass slabs, and enclosed them to Dr. Day, of Boston. I got a report the next day, saying that the matter was undoubtedly from epithelial cancer. I commenced the treatment with carbolic acid, and introduced in the opening, which was big enough for my thumb to enter, a few crystals of this agent. I moved that around with a portion of cotton to bring them in contact with all surfaces. The odor at once disappeared, but there was considerable pain. I told the man to come in again in a few hours. I made another application in such a way as to catch whatever discharge there might be from it. The next day there was not so much as there had been, and no odor. The opening seemed to be larger, and the surface appeared to be a little less indurated. It did not rise up so high above the surrounding surface. I continued this treatment. In three weeks time the whole of the indurated surface had disappeared, and tissue had taken its place, and his face had nearly closed up. There was not an opening as large as a small pin-head. He came in again some time after, with his face looking worse than I had ever seen it at any time. I said to him, "What does this mean?" He said his wife wanted some wood, and he undertook to cut some hemlock wood, and a piece of it had struck him. I had to do the work of treating him all over again. Suffice it to say that the whole surface healed up under the treatment with carbolic acid, and there was no discoloration of the skin and no scar. I hold this theory in regard to cancer of any kind: that it never occurs except when the body is in a low stage of supply of certain elements.

Dr. Truman.—I do not propose to take up your time with the discussion of cancer, important as that may be. Under Section V., I prepared something in regard to pyoktanin, as one of the agents that was introduced during the present year; but inasmuch as Professor Marshall had brought the matter up in a paper, I concluded that I would not present the article, but make a few remarks this morning in regard to it.

Pyoktanin, as you know, was discovered or introduced by Proferror Stilling, of Strasburg, and he gave it the name, meaning pus-killer, from two Greek words. It is simply one of the coal-tar products. It is of an aniline color. Those of you who have not seen it can examine it here on the table,—the yellow and the blue. Pyoktanin may be an excellent agent for the purpose of destroying bacteria in general surgery: I have nothing to say against it there. I believe that its deep penetrating power will probably make it valuable in many directions, but in dental practice we find that this will possibly cause it to enter the tubuli, and produce coloration of the entire tooth.

I do not hold that this agent is of any great value in dental practice, as a germicide. It stains rapidly, as do all aniline dyes. It can be made in solution of one one-thousandth, one part of the agent to one thousand of water. I think the praise bestowed upon this agent by our lamented friend, Dr. Atkinson, while probably deserved in pus-pockets where there is no risk in using it, was overdrawn. I do not regard it of any more value than the ordinary derivatives from coal-tar, as naphthaline or hydronaphthol. All of the agents from coal tar-are valuable, and they are more so, in my opinion, than most of the other germicides in use.

Dr. Fredericks.—I should like to know whether Dr. Marshall attributes that cure solely to the employment of pyoktanin? Whether carbolic acid, for instance, would not answer the same purpose? What caused me to allude to it is this: it is well known that neoplasms sometimes are of such a growth that when the nourishment ceases they soften up, drop off, and in that manner cure themselves. In illustration of how a person can be deceived, Dr. Suchow, of the Charity Hospital of New Orleans, states that he had a case of tumor of over six months' growth. The patient was a negro. He had had trouble with it before, and had had it operated on without success. He had the tumor confined to the lower jaw, and it was of the size of a large walnut. All the roots were affected, and he concluded to extract them as the best course to pursue. This was done, but it continued to progress, and carbolic acid injections were used, and the tumor gradually decreased, and the case was cured. I think there was infiltration, although the injection of the carbolic acid, or the solution of it, say one or two per cent., ended the matter. That is the reason I asked this question. In this case the remedy employed would not prove that it was a cure for cancer; but I would like to ask Dr. Marshall in regard to it.

On motion, the discussion on this paper was passed.

Dr. Patterson then read a paper on "Fracture of the Lower Maxilla by a Gun-Shot Wound; Treatment by an Interdental Splint Bridge," of which the following is an abstract:

The patient was Sergeant Charles Campbell, of the Seventh Regiment United States regular army. In a battle with the Indians he was struck on the lower jaw by a rifle-ball, and the anterior part of the maxilla, from the second bicuspid upon the right to the second molar upon the left side, was shattered. He was given such surgical treatment as could be obtained at the time; parts of the bone and alveolar process were removed, and the wound in the lips and cheek stitched together. It was thought at one time that there would be a union of the fragments, but gradually piece after piece came away, until at one point in the region of the right cuspid, for about six inches, the bone was entirely gone, leaving the remaining parts movable. Six weeks after the accident the patient was brought to me for treatment. I found the following condition: The outside wounds healed with considerable cicatricial tissue; the left fragment of the maxilla was easily movable; an abscess was discharging at the opposite end and another abscess opening under the chin, near the symphysis; the left side of the jaw was much firmer than the right, but had healed far inside of the normal position.

I found that the bridge splint would not be of any avail, as it would result in retaining the incorrect position of the left side, and pressure brought to bear, forcing the pieces apart, would result in a greater deformity.

The first treatment was to overcome, if possible, the incorrect position of the left side. I banded the first molar remaining upon the right side, and also the first upper molar upon the same side, with lugs attached to the bands, for the reception of a screw, and firmly screwed them together. I then placed a jack-screw upon these molars on the palatal side and against the molar on the left, and forced that into its correct position. I then banded the upper and lower teeth upon this side as upon the other, and screwed them firmly together. At the end of three months the patient returned to me, and reported that he felt very comfortable, save that he was confined to soft foods. On removing the bands, the left side, after two or three days, swerved slightly inward, and then remained in almost correct position.

I then made the splint bridge, which you see in the illustration. It has been worn for six months, and the patient, whom I saw four

weeks ago, says he is a new man. He can eat solid food now, and the bridge is a success. He is a young man, in good health, and the chances for growth of new bone are good.

Dr. Brophy.—How many teeth were removed by the accident?

Dr. Patterson.—All the incisors and two bicuspids on one side, and all the incisors and bicuspids on the other, and the top knocked off of one of the incisors (illustrating on the board).

Dr. Carroll.—This is a very interesting case, and I can illustrate it by another example. In 1864 an Irishman was shot in a battle of the late war. A minie-ball entered the left inferior maxilla, between the second bicuspid and molar, at this point (illustrating), producing a fracture here, at the angle of the ramus, between the second bicuspid and molar on the right side, and a fracture at the angle of the ramus on the right side, carrying out, at the exit of the ball, the first and second molars and second bicuspid, leaving the third molar there. A portion of the jaw was left between the second bicuspid and the ramus. The surgeons did not undertake to do anything with him, thinking the man would not live. He did, however, and came to me in February following. This had occurred in November. He was then suffering with phthisis pulmonalis, which had ensued from excessive suppuration. The front incisors on the left side had slipped past, and lay in front. Now mark: this section lay under the tongue, and he could not speak. What did I do with it? The first movement I made was to dissect up that part from under the tongue, and loosen the latter in that section. That gave me all the segments of the jaw, with the jaw loose. He took his food through a tube. I made an impression in very soft wax. I laid this down on my table, and then took an impression of the upper jaw. With both of these I made a rubber splint, and tried to get all the parts up into it, and then open it at the point of fracture. At each point there was an opening and discharge. In all fractures where we have false joints we do not necessarily have an abscess; but there was one here. From what? Necrosis of the bones lying at the ends of the fractures. I resorted to aromatic sulphuric acid, applied in full strength, and the suppuration stopped in forty-eight hours. I followed this treatment until the union of those fractures, and it caused an entire reproduction of the maxilla. The reproduction was completed within about four months. I do not remember the exact time, but I have the minutes of the case, which I shall give at some future period. Here was entire reproduction of the maxilla, which was alleged could not be done. It was a very interesting case.

Dr. Marshall.—I want to compliment Dr. Patterson on the way he managed this case. He made the suggestion that he was waiting very anxiously to get reproduction of bone. It occurred to me that he did not get reproduction of bone. It was a beautiful case for transplantation of bone. I have had a little experience in that line. I have been successful in one case, and not in another. I believe it might be united by transplanting bone in this manner: Laying open the tissues externally, and paring the ends of the bone, and then transplanting the bones of a child which had died at birth, or from a young rabbit half-grown, and taking pieces of the bone as thin as possible, and laying them in rows until the space was closed, and then covering it over completely, placing on the bandages. If this were done inside the mouth, it would be a failure; you would have to do it from the outside, and by putting on the bandages and keeping it perfectly aseptic, the bone would unite. In the case I mentioned not one of them failed to unite; in the other I found that I could not do so, because I did not transplant the bone, and it resulted in a failure.

Dr. Horton.—In connection with this case, I would say that I have a similar one, except that the trouble is of a cancerous nature, and the entire maxilla, from the second molar on the left side to the third molar on the right side, has been removed, and the patient is very anxious that something should be done. The case was that of a man who attempted to cross a trestle-work and fell and fractured his jaw. It was broken in two or three places. The surgeons having the matter in charge at the hospital sent for me to come immediately with my engine and with my drills, to perforate the jaw and put in a splint, which I had done only a few days before. I found that the tissue on the inside of the mouth had not been disturbed. I advised against perforating the jaw, and told them that if they would put on a simple plaster-of-Paris splint, that the thing could be accomplished. It was done, and proved successful.

Dr. Patterson.—Only one word in regard to the advisability of trying the transplantation of bone as has been mentioned. In the case referred to in the paper, I never should have advised it, from one fact alone,—that the jaw upon the right side had been too much shattered. It was in such an incomplete state that it could not have been successful. It would also have broken up the comfortable position of the patient. It was discussed with several surgeons, and it was decided that the patient should not be disturbed.

Subject passed.

Dr. Brophy.—The section has completed all its work, except a method of procedure that I will relate for the radical closure of cleft of the hard palate. It was not my intention when I came here to present anything to the section, as I have succeeded in securing a number of papers, and I believe the time will be quite occupied by them. I have, however, been requested to speak on this subject.

It is well known that in cases of cleft of the hard and soft palates we usually have harelip, single or double. The usual procedure is to close the fissures of the lip and let the cleft of the palate go, to be corrected later in life. This is a mistake, in my opinion. I have held this view for some time, and within the past two or three years I have attempted to make a radical operation for the closure of the hard palate. The closure of the soft palate has long been an operation well known, and, in some instances, the hard palate has also been closed by surgical procedure. The time best adapted to the closure of the latter is in early infancy, from the first to the third or fifth week after birth. We may proceed as I shall describe, and through the kindness of my friend, Dr. Jackson, we have placed upon the board a sketch, so that I may more accurately show you the operation that I am about to describe.

This operation should be made as soon as the organs of the body are performing their functions normally. Frequently, in young children suffering from this deformity, we find them extremely weak and not able to submit to an operation.

This illustrates, as you see, the palatal aspect of the superior maxillary bone. (Illustrating by means of the chart.) This represents the line of separation between the intermaxillary bone and the bone proper. We have a broad cleft of the palate here. To close that, we must resort to something more than external pressure. I am aware that Dr. Sayre, of New York, has operated by adjusting external appliances so as to exert pressure upon the sides of the face. He suggested that these operations might be made for the closure of the palate, since in the early infant the bones are so soft that they may be easily bent in narrow clefts, so that the edges may be approximated. But in this case it is absolutely impossible by external pressure to get the parts in proximity. The method that I have suggested is to first close the soft palate in the usual way, by paring well the borders and closing it with wire. Having freshened the edges of the hard palate, we then lift the lips and the cheeks, and insert a drill, carrying it through the substance of the maxillary bone, so that it will pass through above

the palatal blade. Then beginning with the drill upon the opposite side, carry it through so it will have a small opening from side to side, anterior to the malar process. Then insert the drill back of the malar process, carrying it through in the same manner, so that it will pass above the palatal blade or bone. Having done this, we introduce a strong wire, and carry it through the bone-substance. Then we make use of a lead button; this is perforated, so we may lay it upon the sides of the bone, as shown here,—this representing the buccal surface of the jaw,—and introduce the wire through one of these openings. Now we set those wires up by twisting them together. This is done because it is impossible to exert sufficient pressure to get the parts in proximity. Then with a knife the cheek is lifted and the bone is divided, so as to separate it absolutely from the tissues above. Do this upon either side. Having separated the maxillary bone from the tissues above, we have then no trouble in twisting our wires and setting them up and bringing them in close proximity. By so doing, we will get a union of the bone on either side.

The question may be raised, What will be the effect upon the germs of the undeveloped teeth? That I do not know. I have one case far enough advanced, so that we will soon see what the results will be. Even if the germs of several teeth are destroyed, what is that in connection with the fact of being relieved of such a great deformity. Everything, gentlemen, is in favor of this early operation. The child, in the first place, after the parts are closed, is better nourished. The parts are more easily manipulated. The operation can be made with less shock to the patient, inasmuch as the nervous system of the child is not so highly developed as later. Another thing is that when the child comes to an age when he may articulate, this is correctly performed. He has not the difficulty to overcome, as children sometimes do, and he lives and grows without being embarrassed through life with this great deformity. I would have preferred to write something on this, and to present the matter more concisely, but the section has already occupied a great deal of time, and I will close with what I have said.

Dr. Truman.—What was the age of the patient operated upon?

Dr. Brophy.—Three weeks is the age I prefer. I think that if there are any questions that gentlemen would like to ask, that they should be permitted.

Dr. Marshall.—I would like to ask why this operation is any better than the one introduced by Ferguson. It certainly is a more serious operation. Dr. Brophy made the statement that the nervous

system of a child of that age was not so highly organized as later in life. The fact, I believe, is, and it is almost universally conceded to be, that shock to a little child is much greater than to an older individual, by the same operation. Serious operations are never performed on little children. It is usually put off until after dentition. It seems to me that, in a case of that kind, it would be better to wait until after dentition is completed, and then make the operation in this way (illustrating):

Simply divide the mucous membrane about midway between the edge of the cleft and the inner aspect of the teeth, on both sides, and then, paring the edges, lift the periosteum and suture them together. In a number of cases you will have the formation of bone. That is less serious to a child than the operation Dr. Brophy has indicated. I should think to perform such an operation on a little child would be almost certain death. I am of the opinion that, if he keep a record of his cases, it will almost always prove fatal.

Another way would be to drill the bone and split it, which would be still less shock to the child than would be the practice proposed. I cannot see how that is an improvement upon the old operation.

Dr. Patterson.—I thought it well settled that staphylorrhaphy in the dental profession had been for many years discarded, for the reason that the perfection of articulation is never accomplished by that operation. It is impossible to close the opening whenever there is insufficiency of soft tissues present, and perfect articulation cannot be had.

Dr. Volck.—I have operated on a great number of patients, on the hard and the soft palate. I have had many cases, and I think that operating on the hard palate on young children is a very serious thing. I have seen two of them die from the effects, and I attribute it to the nervous shock. The operation on the soft palate, as our friend tells us, is in most cases successful. The tissue accommodates itself as the child grows, so that the articulation is almost perfect.

I do not give this as a speculation. I give it as a matter of positive experience. The operation on the hard palate, I was on the point of remarking, is very ingenious, but I do not believe a child could stand it. The other which I have performed was done by separating part of the hard palate from the rest, drawing it together.

Dr. Marshall.—With regard to closure of the soft palate, a state-

ment has been made that it is never successful, as far as speech is concerned. That depends on the operation. I say positively that if properly performed, with a sufficient amount of soft tissue, it is generally successful. I have seen a number of cases that have been recommended to wear an artificial piece, which I thought could be better treated by the knife. I will give you one illustration, that of an Irishwoman, forty-nine years old, who came to this country four years ago and went to Boston, and was in the hands of one of the best men we have there. He made her an artificial plate, and after wearing it three or four months she said she could see no change in her speech. She finally came to Chicago, and was sent to me. I tried to understand what that woman said, but she had to write it. I told her to take out the piece, and she did, and I could not distinguish the difference. I said to her, "I think you can be helped by an operation. I do not say this because I desire to perform it, but I think it will really help you." She said, "Anything you recommend I will submit to." I said, "I can put your mouth in as good condition as it is in now, discarding your plate." She consented to it, and if I had her here to-day, there is not a person but could understand her perfectly. She does not talk with absolute clearness, but sufficiently so to be satisfactory.

I operated in this way: I divided the mucous membrane and lifted it up, freshening the edges of the soft palate, and then, when that was completed, I took my knife and cut right through the soft palate, so as to loosen it. That separated and did not unite. She cannot swallow liquids without having them enter the nasal passage.

Dr. Volck.—My way of practice was this: The flap hangs about this way (illustrating); to bring it entirely together is almost impossible; but by separating, from the inside, the velum slightly from the bone, and then slitting it not entirely through, you can get the flaps almost through. They generally hang down, and to bring them together is difficult. Even if brought together, the hard palate beyond these ends will draw back when forced together. The operation is a failure. But if the scalpel is passed under this, and it is then separated from the bone and split, it can be drawn together with great ease, and will heal perfectly. In such an operation on a grown person the difficulty is still greater. I must confess that I have had only partial success in operating on the palates of those who have reached maturity.

Dr. Brophy.—I am highly gratified with this discussion, because it has brought out some features of the operation on the hard and

soft palates that I could not touch upon, and which I will be pleased to answer. Dr. Marshall's remarks, as to the shock caused upon young children, I do not think well established by our knowledge of physiology. The works on physiology are the best authorities to show us that the young child is not so susceptible to nervous shock as one further developed in life. I refer you to standard works in verification of this statement.

As to the next question about the shock produced in this operation, I will answer that our best knowledge is that based upon clinical experience. I have had seventeen cases, in three of which this operation was used, and in not a single instance has there been inflammation. In verification of this, I can exhibit certain patients upon whom I have operated in Chicago. The statement made by Dr. Patterson is one I should possibly have made myself, but I did not enter into all details. I could not for want of time. The question is as to the lack of soft tissue. It is a fact that a child having cleft of the palate when it is born, has, in nearly all instances, as much of a soft palate as any child that is perfect, only the surfaces are not united. If the child be permitted to go on, the soft tissues are all put to use. It is not necessary for me to state that all the parts of the body must be used to be nourished. It is well known that the right arm of the blacksmith is stronger than his left arm, because he uses it more. It is a fact that if the soft palate is closed in a small child it will not develop.

It seems scarcely necessary to speak of this, and the difficulty is that the tissues are not properly brought together and are not well secured.

The usual operation is to carry it around so (illustrating); the tissues must be brought together in this way, so that they will not be allowed to slip back in speaking or crying. There is where the mistake lies,—the carrying of the loop around, and these two flaps not being allowed to unite. If the tissues are not united, if the soft palate is permitted to go without union, there is an atrophy of the parts for want of use. Hence, later in life, as clinical experience shows, the operations have been a failure, because the tissues have atrophied, and we have not enough to bring together and close the posterior nares in speech. We must have sufficient tissue to close these to produce articulation. Later in life it cannot be done; hence the failure.

I am satisfied many a patient is wearing an artificial palate who, had he been operated on early in life, would never have been obliged to submit to such a thing.

There is another feature: some gentleman has said we should wait until the teeth have developed. Do not take those statements down and practise them until you have given this careful thought. Let the teeth be developed and the articulation established, and you cannot make an operation and bring the maxillary bones together without disturbing the articulation. When made early in infancy, it does not effect it to any great extent. If the arch should be contracted, it may be easily expanded. This operation I have performed a great many times by loosening the bone and bringing it over. I regard it as very inferior, however. Later in life we have dense tissues, highly organized, with blood-vessels and nerves. A shock is produced that would not be if the soft parts were brought together when almost in a jelly-like form. This is all I can say about it.

AMERICAN ACADEMY OF DENTAL SCIENCE.

The American Academy of Dental Science held its regular monthly meeting in the Boston Medical Library Association rooms, October 7, 1891, President Seabury in the chair.

President Seabury.—"Inflamed Pulps requiring Extirpation; how best to treat?" is the first item on the card. Has any one any communication or paper on this subject?

Dr. Banfield.—The speedy removal of an inflamed pulp, giving the patient the minimum amount of discomfort, is a matter of considerable importance to ourselves as well as to our patients.

Its removal is accomplished by two general methods: First, through the action of some drug, thereby causing devitalization; second, through the use of probes and broaches. Few patients, however, are willing to submit to the latter barbarous operation. At the present time the destruction of the pulp by the first method is often attended with considerable disappointment, due probably to a stage of inflammation of the pulp which resists the action of the drug used.

A greater or less amount of pericementitis often ensues, rendering the use of arsenic, at this stage, of doubtful value. Our first thought, in cases of inflamed and aching pulps, is to apply some sedative, and, if possible, reduce the congestion. After such an application, we may still find the pulp in the course of a day or two

very sensitive, and upon exposure to the air giving pain which is difficult to control. Unless very carefully inserted the application of arsenic at this stage is liable to cause pain, the pulp also resisting the action of the drug. It has been the custom of some operators, after an arsenical application has been removed and a remnant of pulp found to be still alive and sensitive, to use a combination of tannin and creosote, allowing it to remain for some weeks. I have, however, removed applications of this kind which have remained in nearly a year, and still found the pulp as sensitive as ever.

In view of the liability of extension of inflammation resulting in more or less pericementitis, it seems to me that whenever a pulp resists the action of arsenic or cocaine, the best treatment, for both patient and dentist, is to remove the pulp at once by probes, using an anæsthetic locally or otherwise, provided the pulp-canals are accessible.

We may hope that in the near future, through the use of cocaine or some combination of it with other drugs, we may have better success in treatment of and extirpation of the pulp.

Dr. Williams.—In the early days of my practice, Dr. Harwood always advocated what was called "butchering the pulp,"—that is, taking it out alive. That was before the days of anæsthetics, and Dr. Harwood was very successful in this heroic practice. This method was not attended with the irritability of the root which sometimes follows the application of arsenic.

When pulps are inflamed, the inflammation should first be reduced before an application is made to destroy its life. To reduce this inflammation, I have found nothing better than bicarbonate of soda applied to the cavity on a loose pledget of cotton, and the surrounding parts saturated with chloric ether. This application may be left in place from half an hour to a day according to the extent of the inflammation. After this treatment the pulp is less likely to give pain in applying arsenic.

The pulp may be destroyed after an injection of cocaine, but if the pulp is inflamed, the puncture of a syringe-point must be a decided objection to this operation. Besides, the action of cocaine preparations upon inflamed pulps is uncertain. My general practice is to treat a tooth for the reduction of the inflammation of the pulp, then by applying a sedative combined with the arsenic I generally succeed in the destruction of the pulp or a large part of it. In case the whole pulp is not destroyed by an application of arsenic, my plan is to rinse out the canal and make another appli-

cation, unless the vital fibre remaining is very slight. If that is the case, a weak solution of chromic acid may be carefully applied, this will cause no sensation, providing the root is well closed at the apical foramen. Care has to be taken to prevent the chromic acid penetrating beyond the foramen. Then introduce a fine probe wound with a little cotton saturated with lime-water to neutralize the chromic acid. After that wipe out the root with eucalyptus oil or cajuput, or any non-irritating antiseptic, and stop it up for a test to see if it will remain free from inflammation before making a permanent filling. Sometimes I use what I call a rod-stopping for the root-canals. This I make of tin and lead. I have used wooden fibre and whalebone, but the wood and whalebone were soft, and a properly-shaped metallic rod answers the purpose very nicely. An antiseptic may be put in if you choose, and then the rod, dipped first in chloro-percha, is introduced, leaving length enough for easy manipulation. After inserting the rod-stopping, seal up the external cavity, and give the tooth a rest for several weeks. Give it plenty of time to heal before presuming to open it for the permanent filling.

If you need to give the tooth vent, you can pull out the rod-stopping without digging and working on a sore tooth. And yet, under ordinary conditions, the rod-stopping is just as good for security as the old-fashioned gold filling.

Dr. Banfield.—Do you use any particular proportion of bicarbonate of soda?

Dr. Williams.—No, sir; on a wisp of cotton take up as much as is convenient of apothecary's—not grocer's—bicarbonate of soda, and put it into the cavity, and cover it over with sandarach, to prevent the secretions from getting at it. It seems to reduce the inflammation more readily than anything I have ever tried. Where the pulp is resistant to the influence of arsenic, the bicarbonate-of-soda preparation seems, in some way, to help the destructive effect of arsenic. I have tried ammonia, but it doesn't appear to operate as well as bicarbonate of soda.

Dr. Barker.—There is one thought which has been frequently forced upon my mind in my practice, and that is, that both patient and operator are very apt to expect too much from the action of arsenic in an attempt to destroy the pulp. The previous speakers have noted the importance of reducing inflammation before we apply arsenic. The reduction of inflammation is ordinarily quite a simple matter, sedatives and antacids being useful in this connection. Very frequently we find the pulp inflamed and also strangu-

ated. Simple depletion of the pulp in such a case may reduce the nflammation sufficiently to enable one to apply the escharotic with a reasonable promise of success. For a number of years I have noticed that most practitioners use arsenic in a fearful or timid way. They are afraid to allow arsenic to remain in contact with the pulp very long. Their rule being eight hours for ordinary cases, but, under no circumstances, longer than twenty-four. For a number of years, I have made it a rule not to remove the application under a week, frequently allowing it to remain in a month, and sometimes two or three months. The reason why dentists hesitate to allow arsenic to remain in contact with the pulp for more than twenty-four hours is because they are afraid of a sloughing or some complication they hardly know what. Where bad results have followed, it has been because the dentist has done his work carelessly, the arsenic being imperfectly sealed in the cavity. But if arsenic be applied carefully, after the adjustment of the rubber dam; if it be put in contact with the pulp and sealed in by something more than a mere dressing of cotton, saturated with sandarach varnish, there need be no fear of the result. For the last four or five years it has been my practice to apply arsenic to an inflamed pulp carefully, accurately, making the conditions as favorable for its destruction as I knew how, and then sealing it with a temporary stopping, and allowing the arsenic to remain there ten days. In the vast majority of cases, after such treatment, the pulp will be dead in all its parts.

Mention has been made of the use of tannic acid after arsenic has remained in contact with the pulp for a length of time. I have used tannic acid in my practice to harden and toughen the pulp, so that instead of being obliged to take it out piecemeal, you can drag it out entire.

Nearly all patients, when you tell them that you are going to kill a pulp, expect that they will experience no sensation whatever. They are usually disappointed.

The point I wish to emphasize in these remarks is that the majority of practitioners do not thoroughly seal up the arsenical application, and do not allow it to remain long enough in contact with the pulp.

Dr. Williams.—I would ask Dr. Barker if he would allow arsenic to remain as long in the tooth of a child as in that of an adult?

Dr. Barker.—Certainly not. Good judgment would require that you should not allow it to remain as long in a tooth whose foramen was very large, or in a deciduous tooth, as in an adult tooth.

Dr. Williams.—All we want to get rid of is the vitality in the pulp-chamber. The more vitality we can allow to remain in the tooth aside from that the better.

Dr. Barker.—Of course no one contemplates anything more than the destruction of the pulp. We do not seek to destroy the contents of the tubuli,—that would simply amount to the death of the entire tooth.

Dr. Banfield.—I would like to ask Dr. Barker if, after allowing his preparation to remain in three or four weeks, he finds a little soreness of the tooth on filling it?

Dr. Barker.—Whether I allowed it to remain twenty-four hours or three months, I should expect to find a slight tenderness on percussion.

Suppose we apply arsenic to the pulp of a superior incisor. The moment that pulp is dead, absolutely dead, to the apex, it imparts inflammation to the tissues just outside of the foramen, and you get a little peridental inflammation. The ensuing tenderness is almost pathognomonic of death of the pulp.

Dr. Banfield.—Whenever I have applied arsenic for the destruction of a pulp and the patient reports trouble, I at once nullify the influence of the arsenic, and make an application not only to remove the inflammation, but to make sure that it goes no farther.

Dr. Williams.—If inflammation of the tooth occurs after the application of arsenic, I at once employ some means for reducing it.

Dr. Barker.—A slight amount of peridental inflammation in such cases doesn't alarm me. I look upon it as an invariable accompaniment of the death of the pulp.

Dr. Meriam.—We ought to take cognizance of the inflammation that occurs in the presence of pulp stones, or the deposit of secondary dentine, which is extremely hard to penetrate, and where the use of anæsthetics would hardly avail us. As our remarks are read by men younger than ourselves, we should frankly state our difficulties.

We should also take cognizance of the extreme difficulty of removing many pulps quickly, and that pulps are not all formed on regulation lines; that the majority of those that require extirpation to-day are diseased or partially dead, and are in the molar teeth, and that there can be no royal road for their removal in the anterior roots of the first lower molars.

I have had several cases where, after arsenic had remained in a week, I have found sensitiveness, and in one case I worked up into

he pulp-chamber and removed the secondary dentine at the en-rance to the roots, taking out little plugs like stoppers of glass ottles.

I have found peroxide of hydrogen of advantage in the treatment f partially dead and inflamed pulps previous to the application of rsenic. I do not know that it has the permanent advantage of icarbonate of soda, but it has a use previous to the application of oda.

President Seabury.—When the pulp is devitalized there must be a certain amount of inflammation in order to slough and cut off connections with surrounding parts.

Dr. Smith.—I regret that Dr. Briggs is not here to-night to elucidate his method of treating pulps, inflamed and otherwise, which require extirpation. You are probably familiar with a paper he read before the Harvard Odontological Society and published in the INTERNATIONAL DENTAL JOURNAL a few months ago. His method was to approach the pulp carefully, obtunding it by the use of a solution of cocaine, then by using a hypodermic syringe, on which he has substituted a blunt nozzle for the hypodermic point, to inject the cocaine into the pulp-chamber,—not into the pulp, but around the pulp. According to his report, he has in all cases been able to remove the pulp, fill the canal, and seal the cavity at the same sitting. Dr. Hamilton has also spoken of several successful operations in which he used this method. I have tried it in two cases, both of which were successful.

I have recently used Dr. Harlan's method of making an application of arsenic, iodoform, and cocaine mixed,—the proportions I cannot give you now from memory. This he allows to remain in the cavity for forty-eight hours, then he corrects the influence of the arsenic by the use of dialyzed iron, and then treats the pulp with an alcoholic solution of tannin, which he allows to remain for eight days. At the end of eight days your pulp is tanned, and is easily removed, and, if no secretions have gotten into the cavity, you can seal the canals with success. I have tried this method in several cases, and was successful.

President Seabury.—The next subject is, "To what Extent can Decalcified Dentine be left in Cavities of Decay when using Germicides?"

Dr. Fillebrown.—There should not be, in my judgment, much difference in the amount of tissue left, whether there be germicides used or not. The truth of that statement can be ascertained by considering for a moment the progress of decay, which is, perhaps,

better described by Magitôt and Heitzmann than by any other authors. As I understand it, decalcification goes on to some considerable extent, and then the animal matter of the tooth is exposed to the action of the putrefactive bacteria which break down and destroy the matrix-substance. The discoloration extends into the dentine much farther than actual decay; and the microbes can, and do, force themselves into the tubuli of the teeth to a considerable extent beyond any softening, I should say to the depth of several lines. This is much farther than it is possible for any fluids to penetrate the tubuli of the teeth.

The point I wish to make is, that it is impossible to place in a cavity any substance, either in the form of a solution or otherwise, which will go far enough to reach all the destructive microbes. By dehydrating the tooth-substance, if that were possible, fluids could be made to penetrate more of the dentine than under normal circumstances. But still sufficient penetration could not be produced to reach all bacteria.

Therefore, you must depend upon something besides germicides to stop their action.

Dentine, when so far disorganized that it has lost its vital connection with the normal dentine of the tooth, cannot with safety be left in the cavity. It is claimed by some that it will regain its vitality after the decay has been arrested.

We know that decalcification may go on to a large extent and still the matrix may preserve its vitality, but dentine when softened and beginning to break down cannot be restored, and becomes an irritant instead of a protection, and is unsafe to leave in the cavity. Gutta-percha, cement, or some of the softer fillings, would be equally protective and less harmful to the pulp than disorganized dentine.

Dr. Smith.—I was led to present this subject for discussion from observing among my fellow-practitioners, especially among the young members of the profession, a great tendency to leave decalcified dentine, a punky condition of decay, in the cavity, and then fill it with oxychloride and oxyphosphate of zinc. The fact that they use the rubber dam and a strong germicide excuses them from thoroughly excavating the cavity, and they seem to feel that in this practice they are following the most advanced methods.

I was brought up in a different school, and was taught by that vigorous operator, Professor Moffatt, to thoroughly excavate.

Hard and discolored dentine might be left rather than expose a

pulp, but not the leathery and punky dentine. The many cases of incomplete excavation of cavities which have fallen into my hands, teeth filled according to the method outlined above, do not bear out the statement that it is always a successful method. Operators who follow it do not excavate more because they believe that decay can go no farther after the use of germicides, and that the application of the germicide renders extraction unnecessary. If it does, then I am causing my patients unnecessary pain and taking up their time and my own. The remarks of Professor Fillebrown bear out my ideas on this matter: it is dangerous to leave this punky and leathery dentine in the cavity with the expectation that a germicide will prevent the further progress of decay.

Dr. Williams.—Cavities should be carefully excavated, and no morbid dentine should be left except such as is necessary to protect the pulp. If there has been no inflammation of the tooth, and you find a layer of softened, decalcified dentine over the pulp, there is no excuse for excavating that. To-day I gave a preliminary treatment to a tooth in which I simply excavated the borders, but the depth of the cavity was so very near to the pulp that I could jar it. The cavity was treated with mild antacids and antiseptics, and stopped up temporarily. This treatment will be renewed at short intervals, giving the pulp time to protect itself by a new deposit, so that by and by it can be permanently filled. I had a case, years ago, where I used this method, and which was alluded to in a paper before this society. It was the pulp of a molar which I thought was exposed. I could almost see the pulp, and a very slight pressure caused pain. It was in the case of a healthy young person of perhaps twenty-five, and was treated in a way that I described in that paper,—repeating mild applications at short intervals, the intervals growing longer as the tooth became harder, and allowing ten months to elapse after the last application. On opening the cavity it seemed the attempt was a failure; I thought I could see the pulp as at first, but on passing a probe down carefully, it was found there was a new dentine, transparent as a piece of glass, completely protecting the pulp. I remember lining that cavity with non-conducting material and filling it permanently. In the course of about three years afterwards the same tooth decayed on the distal side, and was very sensitive, showing that the pulp was still alive. If I had excavated rashly in this case there is not much doubt that there would have been a dead pulp. I think it is better to swab out the cavity with weak creosote and some slight antacid than to excavate almost to the surface

of the pulp and put in osteoplastic with its strong acid, which hardens to a solid body and is relentless against the fine pulsations of the pulp.

Dr. Meriam.—We should take into consideration the time we wish a tooth to last. This would make a great difference in our treatment of the temporary and permanent teeth. The idea that an enduring operation can be built on an uncertain foundation should not occur to a well-trained dentist. If we spoke of germs as seeds I think we would understand this matter a little better. Now, what will destroy the life of a germ or seed? So far we have found but one real germicide, and I believe at Johns Hopkins some experiments have shown that for some germs even that (corrosive sublimate) is not a germicide.

If we would realize this and learn the time and treatment that a scientific man would devote to sterilizing any substance, and regulate our treatment by the knowledge thus gained, and expect to be governed by the principles involved, we should in time have some laws of practice to follow and not a mere "*ipse dixit.*" Dentists cannot work contrary to physical laws any more than can others. "Two bodies cannot occupy the same space at the same time." We cannot saturate with a germicide a substance that is already saturated with moisture, unless it can unite with it, and in uniting the germicide may be weakened below its working strength.

We should dehydrate if possible before using a germicide, to secure its penetration.

Nature seems to protect germs of all forms for reproduction. It is recorded that a bulb of Bulbocodium monophyllus showed life after being in a case of specimens, many of which were preserved with arsenic, for over twenty years. Some years ago I called the profession's attention to the coating of the teeth by mucus, and that it would in some cases prevent medicines acting on them, and I have recently been much interested in the experiment conducted at the Dead Sea with its water and the slime or ooze brought down by the stream that runs into it.

The water of the sea was tested in various parts and found to be absolutely sterile, but the mud drawn from its bottom contained germs that were isolated and cultivated. They were in water in which no animal or vegetable life exists, but being protected by the slime or ooze they have been found to retain their life. Now, in view of such retention of vitality, we should not attribute so much virtue to merely slushing a cavity with agents that are not germicides.

Some thirteen years ago, in treating the sensitive teeth of a child, I cauterized them with nitrate of silver, and afterwards without excavating filled with gutta-percha. This completely arrested decay. One of the teeth was afterwards extracted for regulating, and I had a good opportunity to study it. I hope that some time we shall encourage young men to devote some of their chemical training to our specialty, and some future Harvard man may give us a white caustic that will be sightly, and yet as effectual as the unsightly nitrate of silver is.

Dr. Williams.—Dr. Meriam's remarks about nitrate of silver remind me of a method which Dr. Keep tried many years ago when I was a student in his office.

He used nitrate of silver, and afterwards nitric acid, for cauterizing softened dentine which he wished to leave as a protection to the pulp. That process sterilized pretty effectually, but it also sometimes destroyed the vitality of the pulp.

The dehydrating of the tooth-substance, as Dr. Meriam says, is very essential in order to force medicinal applications into the tubuli. Applications can be made more penetrating by the addition of a little alcohol.

As to what Dr. Fillebrown said about germicides not penetrating the substance of the tooth, I think if he were to try first a solution of iron, and then, without removing the iron, apply tannin and insert a filling, he would find he had made ink in the tubuli, and I do not see why it is not reasonable to expect that our corrective agents may penetrate in the same way.

PRESENTATION OF SPECIMENS.

President Seabury said he had a syringe which he valued very highly. The barrel was made of glass, with a platinum point drawn out very fine, making it very serviceable for injecting fluids into root-canals. It also had the advantage that when it became clogged the point could be put in the flame of a lamp and the matter burned out without damaging the point.

Dr. Smith exhibited a set of taps and dies which were made, according to his directions, by S. W. Card, Mansfield, Mass. They were used in making screws, nuts, and jacks, especially in connection with regulating appliances, and he said the advantage which they had over those to be found at the dental depot was that they cut the right size of wire and also a much stronger thread. The set he showed included four different sizes and cut sixty-four threads to an inch, and one of them cut a left-handed thread, which he

used in connection with the Shaw plate for spreading the lower arch.

Dr. Adams showed the model of a case of a nervous old gentleman where he had banded three loose teeth together and then made a plate to supply others that were lost. Two years afterwards their removal became necessary, and the band, together with the incrustation of tartar, made it possible to extract them all at once.

He also showed an appliance for holding the rubber dam in place. It consisted of a piece of piano-wire, three and a half inches long, bent to about a quarter circle, with a small knob at each end, and a loop in the middle. It is applied after the dam is in place, the latter being stretched over the ends and over the middle loop, which draws it away from the mouth in three directions, producing very much the same effect as the depressed dam.

Dr. Meriam read from the "Horticultural Year Book," published in England, an article on the preservation of fruits and vegetables by the insertion of plaster of Paris in decayed places, and Dr. Williams said that he remembered when a boy of seeing a farmer filling up decayed places in a lot of apples with slacked lime for the purpose of preventing further decay.

Dr. Meriam also presented a syringe which he had improvised by using an ordinary hard-rubber syringe and inserting a long piece of platinum and iridium tubing in place of the usual point. It had served admirably in treating a fistulous tract.

WILLIAM H. POTTER, D.M.D.,
Editor American Academy of Dental Science.

ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.

December 12, 1891.

INCIDENTS OF PRACTICE.

Dr. Darby.—I have in this bottle an interesting growth which was recently removed from the mouth of a gentleman. Its position was the roof of the mouth, under a badly-fitting rubber plate. You will observe that it is an inch in length, seven-eighths of an inch in width, and more than a quarter of an inch in thickness. When the gentleman removed his plate preparatory to having some fillings inserted, I observed this growth, which resembled the hypertrophy of mucous membranes often seen where a badly-fit-

ting plate, having a vacuum, is worn. A more careful examination revealed the fact that the mass was loose, and only attached to the surrounding tissue by a small pellicle not greater in diameter than a small quill.

Its removal was a simple matter, which was accomplished with a sharp bistoury. The hemorrhage which followed was profuse. I am sure I speak within bounds when I tell you that nearly a quart of blood was lost before the flow could be arrested.

Upon inquiry, I learned that he had worn a rubber plate for twenty years. This plate supported four incisors, and had bicuspids on either side. It had a large vacuum-chamber, and the superficial dimensions of the tumor corresponded with the shape of the chamber.

The peculiarities of the case are these: First, the enormous size which it had attained; second, the fact that it was loose and entirely detached except as above mentioned; and third, the healthy condition of the roof of the mouth immediately under the growth.

Dr. Gaskill said that he had had a similar case to that described by Dr. Darby, which he preferred to ligate in preference to excision. This was accomplished without the slightest hemorrhage. It covered a space fully equal to the diameter of a dime. It was tied with a silk ligature, and the portion removed was nearly a quarter of an inch thick.

Dr. Truman stated that he thought it was a case of non-malignant epithelioma, saying, "I have a case very similar,—a tumor that has been on the alveolar border for a number of years. I advised that it be let alone or else taken off with a ligature, which the patient objected to having done."

Dr. Peeso was then introduced, and read his paper on Crown- and Bridge-Work.

(For Dr. Peeso's paper, see page 90.)

Dr. Darby.—I have been very much pleased while listening to that paper and in the examination of the work before it was read.

It is not often that we see such beautiful operations. If I mistake not, all of the nine teeth shown in the superior jaw have bands around the roots, and yet none of these bands are visible from the front view, and there did not seem to be the least irritation of the gums about the teeth. To accomplish such results is no mean task, and you will agree with me that it shows great skill and accuracy of detail.

So far as bridge-work itself is concerned I have not had great experience. I have inserted quite a number of small pieces, and

they have proven very satisfactory. I have seen a great many unsatisfactory ones, often the result of bad judgment and worse workmanship. There is no doubt but that much of the bridgework is of poor mechanical construction. When it has been nicely done the testimony of those who wear it is strongly in its favor. I recently saw an extensive piece of this kind of work. There were at least ten or twelve teeth attached to three or four crowns and roots. It had been in use several years, and was in every way satisfactory to the wearer.

Dr. Rymer, of England, was called upon, who said, "I fear in England we are very apt to run down bridge-work, and I think the reason is that we don't understand the way to make it. I am satisfied very few have been trained in the proper kind, but I see no reason why it should not be a success. I hope before I return to England to take with me some few hints, and I shall always have a pleasant remembrance of my first meeting with the Odontological Society of Pennsylvania."

Dr. Head.—May not a cantilever bridge often be more serviceable than one fixed at both ends? I have in mind two cases which may illustrate my meaning. In the first a lateral was to be inserted between a perfectly firm canine and central. The patient was anxious to avoid a plate. A half crown was fitted to the canine. A lateral, with a gold spur to rest against the palatine surface of the central, was attached. Thus in mastication the movement of the teeth did not tend to loosen the foundation of the structure, and yet all blows were met by efficient resistance.

In the other case, a second lower bicuspid was to be replaced. The lower sixth-year molar was covered with a Richmond crown, to which was soldered a gold second bicuspid. From this gold tooth a spur rested on a Richmond crown, previously placed on the first bicuspid. This has proved to be not only strong but cleanly, as a thread could be freely used, and yet the downward pressure absolutely sustained.

Dr. Peeso.—I have seen a great many cases where they have been cemented in or filled with gold, and unless they are strongly dovetailed they are almost sure to work loose. They should be so that a thread can be passed under them and thus kept clean.

Dr. Jefferies.—I have not had a great deal of experience with bridge-work. I was reminded of a case similar to the one Dr. Head mentioned, which I put in a little over a year ago. It was the superior deciduous canine, lost by absorption of the root, and, as the patient had never cut her second canine, I suspended it to a

first bicuspid, which happened to be short and didn't require a very large or conspicuous gold cap; it has a simple spur on the other edge, resting on the palatal surface of the lateral incisor, and it looks well and is perfectly firm and satisfactory.

My experience with bridge-work has been exceptionally favorable. I never put in a piece unless I am perfectly satisfied it will be permanent.

Dr. Kirk.—We have certainly had shown to us this evening that there are two kinds of bridge-work,—good and bad,—and particularly what is meant by the former. There are two questions that have arisen in my mind. In the first place, the question of repairing. Then the other point I want to ask about is this: What limitations does the essayist place upon the insertion of bridge-work? For example, I have been unfortunate enough to lose several teeth,—two bicuspids and one sixth-year molar on one side, and one bicuspid and a sixth-year molar on the other. Now, the teeth he would necessarily select as abutments for a bridge in my case are absolutely sound. In such a case as described, would he consider the insertion of bridge-work a proper thing to do, or would he advise me to wear a plate or go without, which I am now doing?

Dr. Peeso.—There are different ways of doing it. It would take too long to go into the details of the work.

Dr. Kirk.—Suppose between the abutments of a permanent bridge you have some three or four crowns, and one breaks, what method do you pursue in repairing?

Dr. Peeso.—I have never had to repair a piece in the posterior portion of the mouth. I do not make provision for possible breakage. The general practice (illustrating on board) is to drill and let the pin extend through, and, placing cement in between the face and the gold, rivet it in. I use a plate punch that you can apply readily over the tooth and grip with the point of the pliers and rivet by pressure. I don't think there is any danger of the face breaking off the cap. I have never had a facing break but in one lateral incisor, that I replaced two or three weeks ago where it had been broken off.

Dr. Truman inquired if that riveting process would hold, to which Dr. Peeso answered that it could be riveted so as to be quite firm by drilling holes and taking the entire strain off the face.

Dr. Head asked if it is not sometimes advisable not to put on a facing, but to have it all gold.

Dr. Peeso.—It would make it unsightly to have a strip of gold. The thin veneer of porcelain takes very little space, and leaves

a solid triangular piece of gold which will give all the strength required.

Dr. Kirk.—I have had in two or three instances good results by riveting with the Bonwill mallet. I have been able by heavy blows to put on veneers very tightly by using the Bonwill mechanical mallet with a convex smooth point instead of a hammer or riveting punch.

Dr. Place.—I have in mind a young man who has all the molars missing on one side except the wisdom tooth, and that is perfectly sound; the first bicuspid is also perfectly sound, and the canine is missing. Would you devitalize the nerve of the bicuspid to put on bridge-work, or would you leave it as it is, or how would you arrange it?

Dr. Peeso.—This is a question very hard to decide. It would depend a great deal whether the tooth is very prominent or whether it shows very plainly. It is impossible to decide without seeing the mouth. It could be done by putting a full gold cap on the first bicuspid. Placing six teeth on two roots would make a pretty severe strain, but in a great many cases where the teeth are perfectly solid and firm, the case would last for a good many years.

I don't claim to be an expert, and do not feel capable of answering all questions, but during the time I have been engaged in the work I have given it careful study.

Dr. Darby.—Dr. Bonwill has just called my attention to a peculiar case of bridge-work which I showed him last spring. Two molars and a bicuspid had been lost from the inferior jaw. The teeth of the superior were all present and good. It was thought advisable to put something in this space, but a grave difficulty presented. The wisdom tooth, which was to form one of the abutments, had tipped very much forward, but was firmly fixed in the jaw. The first bicuspid, which was to be capped and form the other abutment, had tipped backward. It will therefore be seen that inasmuch as the space near the gum was much larger than between the ends of the teeth, it would be impossible to put the bridge in place if made in one piece. It was therefore decided to make the teeth of gold (hollow gold crowns). This was done, and, when finished, the piece was divided between the caps covering the bicuspid and molar crown, leaving those two intact. The three hollow crowns were then filled with rubber and vulcanized. Two large screws were then put through gold, rubber, and all. The pieces were inserted separately, and when the cement was in the act of setting, the two screws were driven home, bringing the two halves

of the bridge nicely together. The result was eminently satisfactory, and I cannot see how it could have been done in any other way.

Dr. Bonwill.—I look at the case of the essayist with a great deal of pleasure. To my mind it was evidently done very thoroughly, and it looks also, judging from the details given, that it should be very permanent so far as bridge-work can be permanent. Dr. Peeso has covered the ground very nicely, and, what is better, brings up many points against bridge-work. He is not willing to advocate it in every case; I don't think he would be foolish enough to attempt it in a good many I have seen. He may grow bolder as he goes on in the work, and probably overstep the bounds, as a great many others have done. Only one man out of a great many can do it.

I really see but one mistake in this gentleman's work, and that is in the articulation. Without proper articulation it is of little use to the patient. If he will take his case and put the lower jaw in lateral movement on either side, he will find there is no proper articulation. This effect you can see here (indicating) without difficulty. The only thing I would say to the essayist is, learn to articulate properly. Had this been done, the case he has brought here would have been of seventy-five per cent. greater value to the patient. It is impossible to articulate teeth as he has arranged them and get lateral movements.

I have never banded a tooth since 1873, when I commenced to put on crowns, cementing them with the best oxyphosphate. American teeth are not suitable for this work. Now that I use English crowns I have no trouble.

I have brought some casts with me to ask the essayist and those here what they would do under the circumstances. What teeth they would mutilate and from which they would remove the living pulps. They are extreme cases, and I wish your verdict upon them.

It will soon be necessary that dentistry be divided into specialties, and that dentists having cases and recognizing that some other one can do the work in a way that will be much better for the patient should send the patient to such a person, and not presume to do it in an inferior way. All dentists should be willing to confess that in some matters there are others who can perform the work in a better manner than they can.

Dr. Truman.—I know comparatively little practically in regard to bridge-work. I am on record in this Association as in opposition to it and crowns, and I think we have had evidence sufficient to warrant opposition to at least unskilled work.

The first impression I received from the original Richmond crown was that a band placed around a tooth would certainly arouse pericemental inflammation, and that it could not be otherwise so long as it pressed on the pericementum, and I have never wholly abandoned that opinion. Therefore it has been a satisfaction to see this case so free from inflammatory conditions, and causes me at least to modify my former expressed views.

As Dr. Bonwill has stated, there is bridge-work and bridge-work. I question the general ability in the dental profession today to do this. I doubt whether it be possible for many who attempt it to place a band around a tooth that will not arouse inflammation. If the bands fail to fit the roots, inflammation is certain to be developed. It is because the essayist has placed those bands so thoroughly and so perfectly that fluids cannot pass in between them that he has avoided that difficulty. Now, who is capable of doing that? It requires a skilled mechanician. It requires more than this, a man capable of comprehending possible pathological conditions that are likely to supervene, and to understand exactly what he has to do to overcome them when they arise. The time has come for a division of dentistry into special work. There are some of us not capable of doing certain things, and we might as well know it and acknowledge it at once, and not undertake to do everything, oftentimes to the injury of patients.

Adjourned.

CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY.

THE regular meeting was held in Newark, N. J., December 15, 1890.

The President.—Gentlemen, we will now listen to Dr. Westlake, who will read the paper of the evening, entitled "Ethical Environments of the Dental Surgeon."

(For Dr. Westlake's paper, see page 36.)

DISCUSSION.

Dr. Stockton.—The environments of the "dental surgeon" are many. The incidents mentioned by the essayist, perhaps, are not the least. As a rule, I have ever found the physician quite willing to defer to that which clearly and properly belongs to the dentist. I have known of some few instances when the errors of the physi-

cian have been quite disastrous; but we all know little enough, and I think the practice of the day among all intelligent physicians is that they shall do what they are educated and trained to do, and that the dentist shall likewise do what he is educated to do.

The need of an education is one of the most prominent factors in the problem. Men complain of the want of appreciation, and blame the world for not giving them recognition and success, but the fault is at their own door, and they have entered upon the duties of what they are pleased to call a profession, while it may be they are only prepared for the wants of a trade.

The young man entering the profession through our State laws, may think it somewhat of a hardship, and a work of supererogation, to be compelled to pass another examination, fresh from college. Yet, in after years, he will look back and date the beginning of his manhood from this event in his existence, provided always the Board of Examiners do him full justice.

There is no hardship in being compelled to know all that is available in the beginning of our professional or business career. The wheel of life whirls round, and we whirl with it, expecting that the motion will some day slacken, and that then omissions may be made good. But real wisdom consists in packing your storehouse before the winter of discontent sets in.

We have a code of ethics governing us in our relations to each other; rules for our conduct towards each other; and if we transgress them, we are held responsible.

But other duties come in, and they are not all on one side. The ethical relation extends far beyond this, and has its obligations to those and from those for whom we perform our daily labors. The ethical is something that can be appealed to in order to keep peace and harmony amid the conflicting interests of men, to help forward social welfare, and in this way reacting to the benefit of the individual. It is then a sort of police ordinance, written originally in the soul or impressed thereon by society itself, because experience has shown the necessity of it. Ethics may be a science, since it aims to exhibit systematically the facts of moral nature and the principles of conduct. It may be a philosophy, since it aims to set forth the ultimate assumptions in which all these facts and principles have their origin.

Then the end to be sought in life may be learned in general by the study of the nature of man as related to the sphere in which he lives, or is to live, just as we learn the ends of other things by studying the structure as related to their sphere.

But we have not yet a complete science of human nature and relations. Rules of life are thus far subjects for the exercise of good judgment and common sense rather than strict scientific definition.

Resentment against wrong and injury is a sort of natural or implanted moral tone on the side of justice, and when resentment is moralized into justice and the kindly affections into benevolence, it is often thought that the whole field of ethics is covered.

Let us see, to-night, how this ethical relation acts in our every-day practice.

For instance, the other day a lady came to the office, and her salutation was, "Doctor, the tooth you put in for me a short time since has broken in pieces; it broke on my way to market this morning."

I said, "Madame, your tooth did not break itself."

Her reply was somewhat startling,—"Do you think I tell a lie?"

Another tooth was prepared, and as I was about to insert it I handed her a glass, and asked her to see that it was perfect in all respects. She declined the examination, saying it might have a crack *inside*, which she could not see.

Again, you are engaged operating for, it may be, some very particular or distinguished patient, who may have come to you because she has heard your fillings never come out, and in walks a patient, whose first exclamation may be, "Doctor, the filling you put in my tooth has come out." You kindly ask her to take a seat and that you will see her soon. You finish the operation for your distinguished patient, and maybe suggest another appointment, as other work is needed, but she has heard the remarks about the filling, and will not make it now. The patient with the filling out takes the chair, and, after a careful examination and reference to your record-book, you find everything intact, but that a new cavity, in an adjoining tooth perhaps, has just made itself manifest, and you received the blame.

So the subject of the paper, the ethical environments of the dental surgeon, comes home to us in one way or another, and is one that we may and should carry with us, and the thought may arise during its contemplation that we should do unto others as we would they should do to us under the same circumstances.

Dr. Osmun.—One of the points in the paper I have spoken of before,—that is, the education of the public. We hear a great deal about the education of dentists and the elevation of the dental profession, and that is all right and proper; but there is another thing

for the dental profession to do, and that is to take steps to educate the people, so that they can understand what the dental profession is doing. They live in almost utter ignorance of what is being done in the dental ranks. They take the standard of their forefathers and apply it to the advanced dental science of to-day. It is the duty of the dental profession, through its societies, the papers, and the magazines, to spread before the public what is being done in dentistry; and if that were done systematically and thoroughly we would not hear so many remarks and criticisms of the kind that were detailed by the essayist and the preceding speaker.

In reference to the relation of physicians to dentistry, I must say I have never had any of the experience spoken of. The physicians of Newark have treated me, and I think all the dentists of standing, with the greatest consideration, regard, and respect. I have never had any occasion to complain of these things that we hear so much about. I think they are learning a lesson that dentistry is not a trade.

Dr. Sanger.—To one who listens only to the reading of a paper its full value is lost, because the argument, however plain the writer tries to make it, cannot but be somewhat subtile. He has a thought in his mind which he is trying to convey to us, and his words and his thoughts are not our thoughts and words; our ideas do not run parallel with his, and we do not fully catch his meaning. After a paper is printed, and we read it, we are surprised to find a language and force of argument that we did not notice when the paper was read. Dr. Stockton had that advantage, so he could discuss this paper intelligently. The idea suggested by Father Atkinson, that copies of papers to be read before societies should be sent to different members, in order that they may prepare themselves for the discussion of them, is to my mind a good idea, and I think the time will soon come when we shall have such copies printed and placed in the hands of those whom the essayist may designate.

The older school of physicians especially need a little lifting up on the line of dental surgery. We do meet constantly cases where good dental surgery is needed and very bad surgery is practised, and teeth are lost because they fell first into the hands of medical men. It remains for us to educate these men. They are not going back to college and begin over again, and read text-books on the science of dental surgery. It is our duty and privilege to lift up our profession in every way, by practising dental ethics towards each other, the medical profession, and our patients, so that when they come into our hands we shall not take advantage of the fact

that some other practitioner has perhaps made a mistake and has been unfortunate enough to make a bad operation, but we should excuse the fault, remembering that we may make the same mistake, and repair the damage, if there be any, and send the patient out of our office with a kindly word for the man who did the work before us.

Dr. G. Carleton Brown.—I have to disagree a little with the essayist in one or two points. One is the idea that we are a chosen people. I do not believe it. We are what we make ourselves, and not a chosen people. Another point is that the medical profession is all wrong and the dental profession all right. I do not believe it. I think we can make mistakes. They have things to learn from us, perhaps, and we have things to learn from them; and I am of the opinion that when we come to examine the ethical environment of the dental surgeon we will find just as much on the other side of the question as on the side that has been presented to-night.

Dr. Ottolengui.—Mr. President, the point is this: we have been recognized. We are now a branch of medicine; dentistry is a specialty of medicine, and we are considered by medical men as specialists. The man who is a regular physician knows all about obstetrics, but the gynæcologist knows a little more than he does, because he has more practice in that special field; but dental literature, which is so nearly analogous to medical literature, medical men do not know anything about. I will relate a little incident that occurred recently to illustrate what I mean. When I first became associated with Dr. Kingsley, a lady was passed over to me who was wearing an obturator. This patient had a fissure so large that you could put the fist of a baby in the hole, the turbinated bones were very much atrophied, and but little of the tissue of the soft palate was left. That patient when she first came into Dr. Kingsley's hands was only fourteen years old. She wore a velum for seven or eight years, and was most carefully instructed in articulation and speech, until she could do without the velum, then was given an obturator. Ten years after that she was given a new obturator; the case covering about twenty years since she first came for the help of an appliance. There is now nothing the matter with her speech. Ever since she was first placed in my hands she has been practically my patient. Recently the obturator was broken, and so I suggested that it be repaired. She said she had been considering the matter, and had been advised, and would not do anything without Dr. Kingsley's permission. I said, "What have you been

advised to do?" She said, "I have been advised by a great specialist of New York to have this fissure sewn up; he says this thing is well enough in its way, but it is one of those things that a mechanic makes to tide over a case he does not know how to control." That gentleman you would all know, if I should mention his name; he is one of the celebrities in New York. This is one case. There is a child living here in Newark whose parents were so anxious to have a cleft palate remedied that the child was brought to Dr. Kingsley when it was two years old, to know whether the fissure could be sewn up. He said, Yes it could, but his experience was that it never did any good, except perhaps in some cases where there was a great amount of tissue. But they thought they would try it, and they went to a great specialist in New York and had the operation performed. If you know what that means, you know it means a long time of trial and tribulation for the little baby, from three to five weeks of misery. In this case it was longer; and after it had gone on for four or five weeks the fissure reopened, and it was sewn up again. That time the stitches held and the child was pronounced cured. Three months afterwards the cleft opened all along the line of the hard palate, and it was left one of the worst kind of cases to treat. It is easier to fit an obturator for any other fissure than one that has been sewn up. That child shows the failure of staphylorrhaphy most signally. No man here could understand a word that that baby said last summer. An instrument was made for her, and she has been trained carefully in articulation. She is brought over every three months, and every time she comes she speaks fifty or sixty per cent. better than before. These are successes that are being made by dentists in remedying these things; and yet I can show you clippings from the medical press, from one of the first scientific journals of Europe, condemning that very class of treatment, and saying that dentists tell of the wonderful improvements they have made, when they do not know what they are about. I do not believe the person who wrote that ever saw such an operation or knows anything in regard to it.

A gentleman came in the other day and said he had heard that Dr. Kingsley had some experience in treating cleft palates, and he would like to know what to do; that he had a baby born to one of his patients with a cleft palate and he felt concerned about it. I said, "Is there a cleft in the lip?" He said there was. I said, "You had better take care of that; give the child as much lip as you can, but do not crush the maxillary bones." In one case where that was done the result was that the centrals and laterals were removed and

the two canine teeth are in the centre of the mouth, and the jaw is so collapsed that it looks as though the patient had the highest kind of a roof, and the lower lip sticks out half an inch beyond the upper lip. There is no possibility of making a man articulate with that kind of lip. That is what the surgeons are doing right along in this class of cases, and they think they have fixed it all right.

Dr. Westlake.—I have among my patients four physicians, and they are intelligent men, and I know a great many physicians who are intelligent men and who believe a great deal in dental surgery, but they are exceptions. A physician, well-known in Elizabeth, and connected with the hospital, was in the same car with me recently. I said, "Do you have many oral surgical cases?" "Oh, yes; quite a number." "Do you have your dental surgeon perform these operations, as they do in some hospitals?" "No; what good is a dental surgeon except for pulling out teeth? If I had an exsection or a resection of the jaw I would not have a dental surgeon anywhere near me. I would not allow a dental surgeon to operate in the hospital." Now, I think, the public should be educated in this matter.

Dr. Watkins.—I have enjoyed these papers and the discussion very much. The statement in regard to hospital physicians reminds me of a case which fell into my hands some years since. The wife of a homœopathic physician came to my office, and her husband with her, to consult me about her teeth. I looked through her mouth and began to give advice, recommending amalgam fillings. The husband said, "Stop right there. We will have no amalgam." But I insisted on amalgam, and I carried my point. I succeeded in putting in fifteen large amalgam fillings, and she has never been salivated yet.

Articles are appearing from Sunday to Sunday on different subjects pertaining to dentistry in the *New York Herald*, generally a column, and sometimes three or four columns, each time taking up a different subject, and treating it so thoroughly as to give the public a very fair idea of the matter. Since these articles have been appearing in the *New York Herald* patients have come into my office speaking intelligently in regard to devitalizing pulps, removing pulps and putting on crowns, bridge-work, and implanting teeth; and when I would make a proposition to perform a certain operation they would fall right into line with me, and I would have very little difficulty in convincing them that what I proposed was the right thing to do.

Dr. G. Carleton Brown.—Dr. Westlake made some remarks about

a physician of Elizabeth, or, in other words, a most eminent physician, of foreign extraction, connected with one of our hospitals. Now, it happens that I am a dental surgeon of the Elizabeth Hospital, and I will say that there was a case of fracture of the jaw for which I made a splint some time ago, or, at least, Dr. Pinney made the splint, as I wanted to see his method that he used in the Newark Hospital. He made it, and I put it on later, and it worked nicely, but one of the physicians insisted on tearing the bandages off and taking the splint out. A surgeon has charge of a case during his term of office only, and this passed from one to another, and happened to get into the hands of this gentleman of foreign extraction, and he decided that the best thing to do with that fractured jaw was to cut it out. He cut it out. There was some slight necrosis about the fracture.

I do not say that physicians do not make mistakes, but I do not think there is a living dentist who would approve of the excision of the jaw under those circumstances. There was another case where a man was struck in a boiler explosion and sustained a bad fracture of the jaw. I made a splint for him, and the splint was working beautifully, but he was taken to the hospital, and there this same surgeon saw him, and he immediately proceeded to take the splint out, asserting that the jaw would take care of itself. But he is an exception. I do not feel he should be held up as a fair representative of the medical profession of Elizabeth. I think all the dentists there will agree that, with one or two exceptions, we are consulted by the medical practitioners in all cases where we should be consulted.

Dr. Atkinson.—I have too much to say to even begin to say what I would like. It is a question of such deep interest to the human race, and especially to healers of all grades, that we cannot but feel interested whenever the subject is broached, but it is our false morality that has held the ethical field against mankind generally, and it is next to impossible to tell the truth without offending everybody you speak to. It is very easy for dentists to find fault with the men who have assumed a knowledge they did not have, and did not even have sufficient knowledge to entitle them to opinions about the cases they presume to manage. I have been an advocate of dentists having charge of all conditions of the mouth. My complaint is this: that men are not broad enough nor truly in love with the truth themselves to pity the men who assume a knowledge they haven't got, and forget that they themselves have done the very same things they condemn, when they

had but little ground to claim that they were masters of the situation. If I were forced into the position of saying whether I would select a physician or surgeon from the medical men at large or take a dentist, as they run, I would go for the dentist. They are dealing with demonstrative things, and if they begin at a low standard they are bound to rise to a higher and a better appreciation than the men who are everlastingly dealing with figments of fancy, and following the dictum of men who have charge of the poor wretches who go into the hospitals. If we had sufficient juridical balance and mental affection to consider the subject before us and hear whatever testimony there is, and to distinguish between what is really a performance and that which is professed, we would make progress.

You have often thought I was severe upon those who confined themselves to the text-books and hospital practice. If what I said was true, then it was severe; but it was not my affection that was severe, it was my intellection that was severe. But I have been very lenient in telling the truth against the men who claim to be masters of the situation. Who has advocated dental hospitals? Who has opened his office to everybody, the ignorant and the intelligent, and asked them to come and see and criticise? The angels did. They lead every soul that loves the truth to do the things that are requisite for the redemption of the individuals who have been brought into their uncomfortable condition by reason of following a false faith.

The President.—Now, if Dr. Westlake has anything to say, in closing, we will listen to him.

Dr. Westlake.—I have nothing to say, except to thank the society for their attention.

Dr. Atkinson.—If you wish to get the latest investigations on that subject, you will consult the writings of a German, Dr. Zeus, who has made a series of observations in this line. You can learn how to get the book by calling upon Dr. Bödecker.

Adjourned.

Editorial.

TO OUR SUBSCRIBERS.

In the January number allusion was made to the improvement of the circulation and of the material interests of this journal. We do not feel that this simple announcement should pass without further comment.

While the publishers of the International Dental Journal are in the constant endeavor with the instrumentalities of the Messrs. J. B. Lippincott Company, to produce a readable journal and to present the matter submitted to them in good form; while all concerned are faithful and earnest in carrying out the intention of the promoters of an enterprise, entered into for the common good of the dental profession, it is natural for us to bring to our aid the readers of the journal. And we would add, as an opinion, these should not be satisfied until the whole of the readers of dental literature are counted among our subscribers. Therefore, it cannot be too much to ask each subscriber to interest himself in inducing others to place themselves on our lists. This request is not made in a begging spirit; it is done because it is not unreasonable to desire all who are interested in dentistry to become associated with our effort. It is not too much to expect of the dental profession that it shall in the most liberal manner support its good journalism, and whether any person takes one or more dental periodicals, the obligation remains the same to join with the International Dental Journal. We do not attempt to induce such support because it is our sentimental interest to have it so, but for the reason that this journal is a faithful exponent of dentistry, and because we want arrayed with us every one who has a spark of professional loyalty actuating his life.

In the common callings, men stand shoulder to shoulder in support of movements for the common good of their guild, and certainly in dentistry we have reasonable hope for even more interest and more substantial and enduring encouragement.

Therefore, with a feeling of the fitness of things, we want all to be our coadjutors.

IN RESPONSE.

CONTROVERSIES, when carried on for the development of a principle, may be of great value; indeed it may safely be affirmed that no progress can be made without them, but the critical spirit may not always be used with judgment, and our contemporary, the *Dental Cosmos*, will, we hope, pardon us for the opinion that the editorial in the January number, in answer to one of ours in December, partakes largely of that character.

The editorial in the INTERNATIONAL DENTAL JOURNAL was in no sense an effort to lower the reputation of the *Dental Cosmos*, nor was it intended, on the other hand, to elevate the INTERNATIONAL DENTAL JOURNAL.

The text for the article was found in the proceedings of the New York Odontological Society, and was an effort to prove that all journals of a high character "will be read equally and their articles will be copied in proportion to their intrinsic value." That the editor of the *Dental Cosmos* should feel it his duty to controvert this idea seems strange, and yet the spirit and the letter of the editorial indicates an antagonism to the idea of placing the *Dental Cosmos* on an equality with other publications in the interest of dentistry.

We regret that the editor of the *Dental Cosmos*, in the haste to reply to our article, allowed the subjective to overwhelm the objective in his mind, and thereby mistake what he thought we *ought to say*, and place ideas to our credit which do not belong to us, and which a true rendering of the text will not warrant. We quote from the INTERNATIONAL DENTAL JOURNAL of December:

"The question to be considered is, Have we in dentistry a large body of readers? Dentistry is physically a very trying profession, perhaps more so than any other. Very few persons after standing all day over the chair, subjected to the nervous anxieties of patients, are equal to spending their evenings in reading, much less in study. Besides this, it is well known that full practice means constant extra hours of labor, oftentimes far into the night, to keep up with the increasing demands of the clientele. This overtaxing work inevitably decreases the number of readers, and has also had the effect of *limiting* the number of those willing to write for societies and journals."

The reply to this was as follows (*Dental Cosmos* of January):

"Just why the editor of the INTERNATIONAL believes it to be an indisputable fact that there is a *decrease* in the *number of readers* or

in the *number of those willing to write for societies* and journals, it is difficult to understand. Our observation and experience point to the opposite conclusion." (Italics ours.)

We are willing to leave these two quotations to the intelligent reader, for it must be quite evident that the idea of a general decrease in readers or writers was not in the mind of the editor of the INTERNATIONAL DENTAL JOURNAL. It is beyond controversy that the conditions named have a depressing effect and has "limited" the number of those "willing to write for societies and journals." We are prepared to recognize the fact that the number of writers at the present time is far in advance of thirty years ago in "quantity" and "quality," but this admission does not controvert the statement made.

The point we desired to impress upon our readers was, that of the six thousand which we arbitrarily estimated as subscribers of journals, not more than half were readers of the scientific matter contained therein, and that this might safely be reduced still further until all the leading journals were placed, in point of value as disseminators of knowledge, upon one common basis. Our critic furnishes no argument to disprove this, but asserts that these journals "are still far from equality when their value as media for the wide dissemination of thought is compared." Exactly how thought is to be disseminated without readers is not stated. Thought goes with culture and understanding, and if the masses in dentistry fail to aspire to a position above mere routine work, how can the larger number of printed pages of the *Dental Cosmos* accomplish it?

There is a broader question underlying this that our critic fails to grasp. It lies in the fact that journals, no matter how large the circulation, if not imbued with the spirit of the specialty they claim to represent, can never make a legitimate impression. Individuals, communities, associations, and occupations are environed by a sphere of thought which, in a measure, antagonizes every other sphere of activity. Neither can enter into that of the other with any hope of successfully arriving at a correct understanding of the needs and relations incident to each. The publisher of books cannot comprehend the author, or the author the publisher. The jeweller regards with a species of contempt the rougher mechanism of the blacksmith, yet each, in their way, are equally important and potent factors in the progress of the age.

It can be said, therefore, without any disparagement, that the commercial journal cannot enter into the spirit or sphere of that one based solely on professional advancement. There is a natural

antagonism which, while it is not derogatory to either, remains as a perpetual barrier to assimilation.

We have no conflict with the class of journals the *Dental Cosmos* represents; indeed, we go further and say that dentistry owes, in this country, if not in the world, an immense debt to the publishers of the *Dental Cosmos* and its predecessor, the *Dental News Letter*, for the aid given the dental profession in its days of struggle to something higher. This debt may never be paid properly, but it should always be considered when this subject is presented for discussion. While this is true, and gratefully acknowledged, it does not lessen the duty of dentists to grasp the important fact that this condition of affairs cannot, should not, be eternal. Just so long as dentistry is dependent on commercial journals for the presentation of its ideas, just so long will the spirit of trade, good in its place, permeate throughout the profession.

The editor of the *Dental Cosmos* fails to perceive the relevancy of the quotation given by him, that "the battle can be, *must be*, fought within our own lines." That it is "unintelligible" to him is only another proof that he, in common with many others, is unable to recognize the drift of sentiment, or to be awakened from a lethargy sad to contemplate. There is a spirit, we are happy to believe, abroad in the dental profession, that proposes to fight on and battle bravely until it stands upon a sure foundation, and one of which no man need be ashamed. May the editor of the *Dental Cosmos* rise to the light of the coming day!

Bibliography.

LIPPINCOTT'S MONTHLY MAGAZINE for January is a valuable number. "The Passing of Major Kilgore" (told by the City Editor), by Young E. Allison, is a story by one evidently familiar with newspaper life, and it, therefore, gives very vivid impressions and experiences therein.

Two fine portraits are given, one of Agnes Huntington and the other of Sydney Woollett, the reader, or "Interpreter," as Julian Hawthorne prefers to call him, in his very interesting account of Woollett and his work, which accompanies it.

TRANSACTIONS OF THE AMERICAN DENTAL ASSOCIATION. Thirty-first Annual Session, held at Saratoga Springs, New York, commencing August 4, 1891.

This exceedingly neat volume of two hundred and seventy-one pages contains the proceedings of this annual gathering. It is not too much to say that but few, if any, of the previous meetings of this association can compare with it in the presentation of papers of solid scientific value. The contents are well worth preservation in permanent form for careful reading and reference.

THE INTERNATIONAL JOURNAL OF SURGERY, New York City, opens the new year with its fifth volume.

There is no change in the editorial department, and the journal will, therefore, be conducted with the same marked ability which has heretofore governed its pages.

THE SANITARIAN, Brooklyn, N. Y.

This journal enters its twentieth year in 1892. It is "devoted to the promotion of the art and science of sanitation, mentally and physically, in all their relations, by the investigation, presentation, and discussion of all subjects in this large domain as related to personal and household hygiene."

This extensive ground is ably covered in this journal. The subjects of which it treats are of peculiar importance to the dentist, who is doomed to a sedentary life and requires the best sanitary conditions. He, above all others, should make this subject one of careful study.

Current News.

ODONTOGRAPHIC SOCIETY OF CHICAGO.

AT the annual meeting of the Odontographic Society of Chicago, held December 14, 1891, the following officers were elected for the ensuing year:

President, E. L. Clifford; Vice-President, Geo. J. Dennis; Recording Secretary, U. G. Poyer; Corresponding Secretary, T. A. Broadbent; Treasurer, E. Noyes.

Board of Directors.—E. L. Clifford, Geo. J. Dennis, U. G. Poyer, R. B. Tuller, C. E. Bentley.

Board of Censors.—D. C. Bacon, Louis Ottofy, D. M. Gallie.

T. A. Broadbent,
Corresponding Secretary.

ANNUAL MEETING OF THE LOUISIANA STATE DENTAL SOCIETY.

The Annual Meeting of the Louisiana State Dental Society will take place at New Orleans on March 2, 1892.

The profession at large is invited to attend. The date of the meeting is the day following Mardi Gras, and at which time very liberal rates can be secured.

Dr. J. E. Dugger,
Corresponding Secretary.

Selections.

CARBOLATE OF CAMPHOR.

This preparation is made (*Therapeutic Gazette*, February, 1891) by adding one part, by weight, of carbolic acid to three parts of camphor, setting aside for twenty-four hours, and straining through gauze. It is a permanent liquid, with a specific gravity of 990. It is thoroughly antiseptic, and possesses unsurpassed germicidal powers. Locally applied to wounds, by means of cotton or gauze, it prevents suppuration. When kept in contact with the skin for several days, it produced an eruption which can, however, be prevented by mixing the liquid with oil. Injected hypodermically, it gives the best results in aborting abscesses or boils and relieving pain.

When placed under the skin, it produces anæsthesia of the surrounding parts, which lasts for several hours. There is some soreness, but no abscess results. The slight smarting felt at first

shortly disappears. For hypodermic use, a little ether or pure alcohol should be added to the liquid.

Carbolate of camphor combines readily with alcohol, ether, fixed and essential oils, and petroleum derivatives, but *not* with aqueous solutions or glycerin. It readily dissolves menthol, cocaine, salicylic acid, chloral hydrate, iodoform, and corrosive sublimate.

According to M. B. Cochran, carbolate of camphor gives excellent results when locally applied in inflammations or ulcerations of the tonsils, pharynx, or cervix uteri, and as a dressing in all kinds of wounds, where it readily prevents suppuration, and acts as an antiseptic. As a lubricant in massage it is unsurpassed, especially in contracted muscles and stiffened joints. In herpes and erysipelas, applied with a soft brush, the remedy acts as a specific, relieving the pain and causing a healing process to be set up at once.

The writer reports a case of the latter affection in a child three weeks old. There was intense swelling of the face, the eyes had not been seen for two days, and the lips were so swollen that the infant could not suckle. The disease was rapidly advancing to the scalp. A mixture of one part of carbolate of camphor to two parts of olive oil was brushed over the face every three or four hours. The disorder was checked from the first applications. In twenty-four hours a marked change was observed. The child made a final recovery.

Good effects have been observed from the use of the remedy in vaginitis, vulvitis, and pruritus vulvæ; also from its employment in cases of frost-bite. The best results have been obtained by internal administration in the form of capsules, in cases of gastric and intestinal catarrh.—*University Medical Magazine.*

PHYSIOLOGICAL ACTION OF PEROXIDE OF HYDROGEN.

In a preliminary paper on "Peroxide of Hydrogen," which he has continued to study since his original investigations published in 1860, Benjamin Ward Richardson (*The Asclepiad*, first quarter, 1891) adds considerably to our knowledge of a drug which has lately claimed much clinical attention. In his physiological researches he finds that "living cell-structure of every kind, presented to the peroxide solution, if it does not absorb, liberates the oxygen, and seems to distinguish by that phenomenon organic structure that has become cellular, organic, and vital, from that which is not yet cellular or organic, and from that which has passed

from the organic and vitalized state to the inorganic and dead." Upon open surfaces meeting with organic material, oxygen is liberated and decomposition produced, a process which is hastened by elevation of temperature and pressure. Again, if introduced within mucous cavities which contain no foreign substance capable of liberating oxygen (*e.g.*, pus), the peroxide is not decomposed. Under these conditions, absorption into the circulation with liberation of oxygen takes place, and if this gas be in too great quantity to be carried away entirely by the red blood-disks, it accumulates in the chambers of the circulation and causes death in the same way as air injected into a vein. A similar result follows injection within the peritoneum. Subcutaneously injected, the peroxide is at once decomposed with the production of temporary emphysema and elevation of temperature, with partial arterialization of venous blood, but without important local trouble resulting. When injected directly into the lung, there is diffusion of oxygen, so that life may be supported for several minutes with respiration entirely cut off. Purulent matter and probably the white blood-corpuscles liberate oxygen very freely from the peroxide; the author inclines to the belief that bacteria may have the same reducing power.—*University Medical Magazine.*

CARBOLIC ACID, CREOLIN, AND LYSOL.

From *Revue d'Hygiene* we extract the following notes on the work of Drs. Remonchemps and Sugg, relative to the comparative disinfecting values of carbolic acid, creolin, and lysol. The last is a comparatively new addition to the list of disinfectants. The result of various studies of creolin were given in the Fifth Annual Report.

The authors used the bacilli and spores of anthrax, of typhoid fever, and of cholera in their provings. On the free spores the agents all act slowly; creolin and lysol act a little more promptly than carbolic acid on cultures in bouillon, but the difference would not amount to much in practice. There is, however, an important element of safety, due to the difference in the poisonous properties of these agents. While it took only .30 gramme of carbolic acid to kill a given weight of rabbit, it required 1.10 of creolin or 2.30 of lysol.

One interesting point brought out is that spots on clothing, soiled with fæcal discharges of typhoid fever and cholera patients,

may be completely sterilized in two hours in a one-per-cent solution of any one of these agents cold, but if warmed to 122° F. the sterilization is complete in thirty minutes.

With lysol disinfection of the hands and instruments was accomplished with a five-per-cent solution in five seconds, especially when warm; with a two-and-a-half-per-cent solution ulcers and cavities were disinfected in five minutes.

Lysol is a thick, light-brown liquid, with a specific gravity of 1.042. It is perfectly soluble in water, and forms a clear solution in contradistinction to creolin, which forms a milky opaque emulsion. In washing in a solution of lysol it forms a lather, and thus, while exerting the action of a disinfectant, it plays the part of a soap. It therefore has the advantage of easily and rapidly permeating tissues with which it is brought in contact.—*Sanitary Inspector.*

MERCURIAL STOMATITIS.

Fournier, in his clinical lecture on this subject (*L'Union Médicale*, February 3, 1891), alludes to the fact that the older writers frequently mention this affection as causing deep, even phagedenic ulcerations, which, on healing, bound the jaws firmly together. Abundant hemorrhage accompanied these ulcerations. The teeth were lost and necrosis occurred, even death from exhaustion sometimes following. We do not see such cases now, because we do not believe that the germs of the disease are voided by the salivation produced. Formerly inunctions were much used.

When mercury is given by the mouth, stomatitis is slow to begin and is progressive; it announces its advent by mild symptoms; it does not progress beyond a medium degree of intensity. Stomatitis from inunctions is exactly the opposite: its invasion is sudden; it affects the whole mouth simultaneously; it is very severe.

There are two theories in regard to salivation: one regards it as an inflammation of the salivary glands, the secretion from these irritating the mouth; the other holds that the mercury irritates the mouth and provokes the salivation. Nearly every one believes now that the stomatitis is primary and the salivation secondary. A third theory ascribes the cause to a microbe.

To avoid salivation, be sure that the mouth and teeth are in a healthy state; caution patient to watch for symptoms; keep the mouth clean with a wash of chlorate of potash, and brush the teeth

with equal parts of charcoal and cinchona, or cinchona and tannin, with essence of mint to flavor; watch the mouth for any indication of the drug's action; stop the treatment at the first alarm.

When salivation has occurred, touch the eroded points with a crayon of nitrate of silver and order mouth-washes of marsh-mallow and chlorate of potash or alum, two to two-and-a-half per cent. Chlorate of potash may also be given internally. In severe cases chlorate of potash, one and a half to three drachms per day, in sweetened water or gum syrup, will, in a few days, produce a calming effect. During the acute period irrigate with marsh-mallow solution, milk or plain water. Later on potash- or boric-acid washes may be tried and the gums may be painted with cocaine. Light superficial cauterizations may be made over small areas. Sedatives like opium will also be useful in the course of the affection.—*University Medical Magazine.*

THE STRUGGLE AGAINST DISEASE.

Dr. J. Burden Sanderson, in concluding a series of lectures upon the nature of infectious diseases, remarks: "We have learned on the one hand from the experiments of Behring and Kitasato, on the other from those of Büchner and Emmerich, that a substance is contained in the liquor sanguinis that acts in relatively small doses, that is capable of counter-infecting the whole organism, and that by combining antibiotic and antitoxic properties in varying proportions adapts itself to the requirement of the particular infection against which the organism needs to be protected.

"It has been proved that the organism possesses the power of bringing into existence certain chemical agents which are the embodyment of the particular *vis protectrix* required, by which the organism guards itself against some of the most important of the specific infections to which it is exposed.

"To have learned this is to have entered on the beginning of a new progress, to have turned over a new leaf in pathology. It seems to me that it requires no prophetic power to foresee that we are on the very threshold of discoveries in medicine such as will eclipse in their splendor all that have preceded them."—*British Medical Journal.*

THE

International Dental Journal.

VOL. XIII. MARCH, 1892. No. 3.

Original Communications.[1]

THE SYRUP OF IRON CHLORIDE.[2]

BY G. W. WELD, M.D., D.D.S., NEW YORK.

MR. PRESIDENT AND GENTLEMEN OF THE ODONTOLOGICAL SOCIETY OF PENNSYLVANIA,—I wish to gratefully express my convictions that no small share of any success which I may have met with in my experiments is attributable to the circumstance of my having had the assistance of one or two distinguished chemists, and the friendly encouragement of a goodly number of physicians residing in New York. Having been led by special circumstances, some seven years ago, to begin a series of experiments, I found it impossible to continue without sacrificing a large portion of time usually allotted to repose, at no inconsiderable cost of both health and spirits. The experiments have been associated with certain other disadvantages, which accounts for the imperfection of some of the first productions.

From the testimony of several physicians who have lately employed the preparation in their practice, I am led to believe that I have finally succeeded in changing an old reliable compound of iron into what may be considered a new compound, concerning which the merits are worthy the thoughtful consideration of the medical and dental professions.

[1] The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

[2] Read before the Odontological Society of Pennsylvania, January 9, 1892.

Whatever may be thought of the SYRUP OF IRON CHLORIDE, I wish to observe just here that the experiments have been conducted in a grave and earnest spirit, my only aim having been to produce a compound of the chloride which could be presented in a potent and permanent form (not emasculated), easily assimilated, and accompanied with all the virility of the tincture without its objectionable features.

For a proper understanding of the subject (as the syrup of iron chloride is nothing more nor less than the tincture of the chloride of iron slightly modified), permit me to introduce the same by first making a few remarks on the tincture.

The tincture of the chloride of iron is made from the liquor ferri chloridi, and contains thirty-seven and eight-tenths per cent. of the dry chloride. In making the tincture of the chloride, thirty-five parts of the liquor are added to sixty-five parts of alcohol. Attfield says "that the liquor which is used in making the tincture contains much free acid," which, it is claimed by some authorities, is necessary to prevent the precipitation of the basic salts of iron, and this free acid contained in the tincture constitutes one of the objections which has been raised against its use, because of its destructive energy upon the enamel of the teeth.

Before an audience composed chiefly of dentists and physicians it would seem to be almost the triteness of an observation to comment on the pernicious influence of free hydrochloric acid upon the structure of the teeth; but as we judge everything by contrast, and as the syrup of iron chloride is characterized by an absence of this one particular objectionable feature, I trust you will pardon me when I allude to the observations and conclusions of one or two other gentlemen who have experimented on the subject.

The results of the experiments of Dr. Smith,[1] of Edinburgh, Scotland, are interesting to both the physician and dentist. Dr. Smith experimented with eight of the compounds of iron, which at the time the experiments were made were most generally used as remedial agents. These were the saccharated carbonate of iron, twenty grains to an ounce of water; carbonate of iron, in the same proportions; syrup of the phosphate combined; the syrup of the iodide of iron and water, equal parts; the citrate of quinine and iron; the wine of iron; the sulphate; and the tincture of the chloride of iron. On examining the respective solutions after twenty-four hours, the teeth were found unaltered in those of the carbonate,

[1] *Edinburgh Medical Journal*, 1886, vol. ii. p. 631.

saccharated carbonate, phosphate, iodide, citrate, and the sulphate. In the solution of the wine of iron, the liquid itself was somewhat turbid; the teeth, however, appearing to be untouched. In that of the chloride of iron, a turbid sediment filled the bottom of the bottle and covered up the teeth from view; the fangs of the teeth were somewhat soft and flexible, and the enamel easily scraped down. The sediment under the microscope presented an amorphous appearance. In conclusion, Dr. Smith further says that, of his experiments, it would appear that certain preparations of iron, when directly applied, do exercise a powerful effect on the substance of the teeth; and the ratio of the effects obtained would seem to prove that, of all the preparations employed in these, that of the tincture of the chloride of iron acts more powerfully; the sulphate of iron next; and next to that again, although in comparison very immaterially, the wine of iron,—the other preparations of iron appearing to be inert.

At a somewhat later period, Dr. J. H. McQuillen, of Philadelphia, in speaking of the effect of this preparation of iron on the teeth, stated, in an article published in the *Dental Cosmos*,[1] that "a young lady, whose teeth, originally of excellent material, are now in the most dilapidated condition, informs me that she has taken the tincture of muriate of iron almost daily during the last year.

"In her case not only the affinity between the hydrochloric or muriatic acid and the lime in the teeth has been fully demonstrated, but, in addition, the impropriety of an indiscriminate use of that valuable remedy.

"Employed, as this agent sometimes is, for a week or weeks, with the direction to take fifteen drops every two hours in a little water, without any caution or corrective against its deleterious influence upon the teeth, it is no wonder that organs which are so important to health and appearance as the teeth should have their integrity seriously if not irremediably affected."

In connection with the direct action of the tincture upon the enamel, the experience of a physician of New York, Dr. E. M. Cameron, is worthy of more than a passing notice. Dr. Cameron, while visiting a sea-side resort a few summers ago, was called upon by a lady, suffering with intense pain, to have the right lower molar extracted. In the absence of a dentist, he succeeded, he said, in extracting the tooth. He was summoned again a few hours after

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[1] "The Deleterious Effects of the Muriate of Iron on the Teeth." Vol. viii. p. 345.

to see his patient, whom he found suffering with an excessive hemorrhage due to the extraction. Not having the usual styptic,—the tersulphate of iron,—he applied upon a pledget of cotton a small quantity of the tincture of the chloride. On calling upon the lady the following day, he was welcomed with the exclamation, "Doctor, you have stopped the hemorrhage, but you have destroyed two teeth!" On examining the adjacent teeth, he discovered that the enamel on the anterior and buccal surface of the second molar and on the posterior and buccal surface of the second bicuspid was softened to such an extent that it could be easily scraped off with the finger-nail. The case made such an impression on his mind that ever after, when he found it necessary to administer the tincture of the chloride of iron, he said he did so with a considerable degree of reluctance, and invariably cautioned his patients regarding its use, at the same time suggesting such precautions as he thought would best counteract its destructive influence.

One of the precautions generally suggested by the medical practitioner is to direct the patient to dilute with water. But chemical observation shows that water increases the destructive energy of the tincture of chloride of iron upon the structure of the teeth more than any other fluid. As an illustration, the effect of adding water to a simple solution of the chloride of iron is to give us basic salts of iron and the separation of free hydrochloric acid. If a freshly-extracted living tooth be immersed in the officinal tincture of the chloride,—say for a period of twenty-four hours,—we shall find that the enamel, the most susceptible portion of the tooth, is not injured in the slightest degree; but if the same tooth be immersed in the tincture diluted with water, in proportion of one to eight,—*i.e.* one part of the tincture and eight parts of water,—we shall find that the enamel is materially injured within a period of one minute. It is not, therefore, entirely a matter of the strength of the acid that is likely to injure the teeth, but a matter of fluidity or solubility. To illustrate still further: When a piece of zinc is immersed in strong sulphuric acid (H_2SO_4), it will be observed that the acid has no effect upon the structure of the zinc; but if a little water be added to the acid, we find that the zinc is immediately attacked by the acid. The zinc in the strong sulphuric acid is protected from destruction in the same manner that the enamel of the tooth, which is immersed in the strong tincture of chloride of iron, is protected,—viz., the surface is blocked up with the basic iron salts, insoluble in alcohol, which prevents chemical action. In case of the zinc, it is the sulphate of zinc resulting from the first action, which is in-

soluble in the concentrated acid, that forms a protecting coat over the surface of the zinc. The addition of water dissolves this protecting sulphate and renders further chemical action possible. In case of a tooth immersed in the pure tincture of the chloride of iron, a similar action takes place,—viz., the oxide of iron first formed protects the tooth from immediate chemical action, owing to its compact adherence to its surface. As additional testimony relating to the injurious action of the tincture of the chloride of iron upon the teeth, I might add that almost all authorities on therapeutics and materia medica have expressly laid down the fact that the acid and astringent preparations of iron act on the teeth with considerable energy.

It seems unnecessary, therefore, to cite any more cases, either for the purpose of showing the destructive tendency of the above-mentioned preparation of iron on the enamel of the teeth, or that physicians or dentists are ignorant of such a condition of affairs. It is now, I believe, generally admitted by almost every one who, I might add, has had an opportunity of observing the effects, that the tincture of the chloride of iron, although passing transiently through the mouth and over the surfaces of the teeth, nevertheless exerts a most powerful and pernicious action on their structure.

We will now consider the so-called indirect or secondary effect of acids on the fluids of the oral cavity.

It has been observed by one or two prominent gentlemen in the dental profession that, after taking the tincture of iron for a certain period of time, the saliva, ordinarily alkaline, became acid in reaction,[1] and the question has been raised whether such a condition of affairs might not seriously affect the integrity of the teeth. It is possible that the ingestion of a large quantity of acids, even in normal health, may decrease the alkalinity of the blood to such an extent that the glandular secretions of the mouth will be rendered more or less acid. I can only say that I have never been able, although I have taken a large quantity of the mineral acids, to produce such a change in the secretions of my own salivary glands.

We know that the urine, which is normally acid, is very susceptible of a change. But it must be borne in mind that the urine has a character altogether peculiar, and one which distinguishes it completely from every other animal fluid. All the others are either

[1] "Human Physiology," Dalton's fourth edition, p. 333; see Dr. Bogue's remarks, INTERNATIONAL DENTAL JOURNAL, August, 1891.

nutritive fluids, like the blood and milk, or are destined, like the secretions generally, to take some direct and essential part in the vital operations. Many of them, like the saliva and the gastric and pancreatic juices, are reabsorbed after they have done their work, and again enter into the current circulation. But the urine is merely a solution of excrementitious substances. There is a wide difference, accordingly, between the action of the kidneys and that of the true glandular organs, in which certain new and peculiar substances are produced by the action of the glandular tissue. The kidneys alone are purely excretory in their offices; and the urine is not intended to fulfil any function,—mechanical, chemical, or otherwise; but it is destined only to be eliminated and expelled. It is not surprising, therefore, that most medicinal and poisonous substances introduced into the circulation should be expelled from the body by the same channel. Those substances which tend to unite strongly with the animal matters, and to form with them insoluble compounds, such as the preparations of iron, lead, silver, arsenic, and mercury, are least liable to appear in the urine. They may occasionally be detected in this fluid when they have been given in large doses, but when administered in moderate quantity are not usually to be found there.

Most other substances, however, accidentally present in the circulation, pass off readily by the kidneys, either in their original form or after undergoing certain chemical modifications.

The salts of the organic acids, such as lactates, acetates, molates of sodium and potassium, when introduced into the circulation, are replaced by the carbonates of the same bases, and appear under that form in the urine. The urine accordingly becomes alkaline from the presence of carbonates whenever the above salts have been taken in large quantity, or after the ingestion of fruits and vegetables which contain them.

Bartholow,[1] in his treatise on Materia Medica and Therapeutics,

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[1] "A Practical Treatise on Materia Medica and Therapeutics." Roberts Bartholow, M.A., M.D., LL.D., third edition, p. 87.

Professor Lehmann found that the urine exhibited an alkaline reaction a very few minutes after the administration of lactates and acetates. In one instance, by experimenting upon a person with congenital extroversion of the bladder,* in whom the orifices of the ureters were exposed, he found that the urine became alkaline in the course of seven minutes after the ingestion of half an ounce of acetate of potassium.

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* "Physiological Chemistry," vol. ii. p. 133.

says that "the mineral acids, especially hydrochloric, have been proposed as remedies for ACUTE RHEUMATISM.

"The unquestionable utility of the tincture of the chloride of iron in rheumatism lends support to this practice. It is highly probable that the mineral acids check the formation of lactic acid in the blood." On another page the same author states,[1] "The mineral acids, when administered in medicinal doses, must on reaching the stomach act in accordance with their chemical position: they will combine with the bases and form salts; hydrochloric, and to a less degree phosphoric, aid digestion, acting as synergists to pepsin, and contribute to the formation of peptones. . . . It is true of all the mineral acids that their long-continued use diminishes the production of acid gastric juice, and in this way after a time they cause the very trouble for the relief of which they were originally administered. An acid solution on one side of an animal membrane and an alkaline solution on the other, is the condition most favorable to osmosis, hence the introduction of an acid into the stomach with sufficient quantity must impair the production of acid gastric juice. In practice this is found to be the case. The mineral acids are among the most diffusible substances known, and of these hydrochloric stands at the head; so much of these acids as do not enter into combination in the stomach diffuses quickly into the blood, and the salts which they form by combination with bases follow the laws of diffusion according to their class. The acids, especially the hydrochloric, and next nitric, diminish the alkalinity of the blood."

The researches of Garrod[2] are also interesting in connection with the subject. His researches appear to show that the pathology of certain forms of rheumatism, particularly gout, involved a peculiar morbid condition of the blood,—viz., an accumulation of uric acid, of which the blood in health contains a trace.

There is no authority, however, so far as I am informed, for assuming that the human saliva is ever rendered acid by the presence of acid in the blood; and because the urine is easily changed from an acid to an alkaline reaction, it in nowise follows that the saliva can be changed from an alkaline to an acid condition.

There appears to be but two ways to account for the statement

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[1] "A Practical Treatise on Materia Medica and Therapeutics." Roberts Bartholow, M.A., M.D., LL.D., third edition, p. 83.

[2] In forty-seven cases of gout, an analysis of the blood-serum by the same experimenter showed a notable increase of this constituent.

recently made by Dr. Bogue,[1]—viz., that after taking the tincture of the chloride of iron he observed that "acid in his *saliva* was distinctly perceptible."

1. The presence of free acid in the blood.

2. A derangement of the secreting glands; the admixture of mucus; and the production of the *sympathetic saliva*[2] of the physiologists.

Regarding the first point, it may be said there is no chain of evidence from a physiological stand-point which affords any reason for believing that such a condition of affairs ever exists. Of course it is unsafe to say *a priori* that a certain thing cannot take place, especially when a careful and observing man like Dr. Bogue says that it does. But, as I recently stated in my lecture read before the Odontological Society of New York, I am unable to find any authority, and I know of no good reason for believing, that the secretions of the glands of the oral cavity can be rendered acid *by the ingestion of acids.*[3] It has been observed that in an animal where the alkalinity of the blood approaches even a neutral point the animal will die.

The presence of alkalies is essential to the oxidation of the organic constituents of this fluid,—in fact, as necessary to the life of the corpuscles as water is necessary to the life of a fish, or common air to the life of mankind.

Wright[4] found, on injecting various acids into the veins of

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[1] See Dr. Bogue's remarks made before the Odontological Society, New York, and published in INTERNATIONAL DENTAL JOURNAL, August, 1891, p. 552.

[2] The reflex secretion of saliva by means of the *chorda tympani* nerve, etc.

[3] Wright states, it rarely happens that the salivary glands, when in a state of healthy activity, perform an excernent function to free the blood from any temporary impurity, unless the organs proper for this task shall fail in discharging it.

1. The reaction of the blood is alkaline owing to the presence of disodic phosphate, NA_2, HPO_4. (Maly.)

2. The alkalinity is less in persons suffering from anæmia, cachectic conditions, and chronic rheumatism. (Lépine.)

[4] See Piggott on saliva, *American Journal of Dental Science*, vol. iii. p. 342.

Piggott on morbid change of saliva, *American Journal of Dental Science*, vol. iii. p. 582.

Later experiment by Lehmann and Jacubowitsh have not supported all the results obtained by Wright.

The parotid saliva is obtained by placing a fine canula in Steno's duct (Eckhard); it has an alkaline reaction, but during the first few drops may

healthy dogs, that in only one instance did the salivary glands excrete the injected acid. The subject of this observation was a strong bull-terrier dog, into the veins of which has been thrown three drachms of pyroligneous acid diluted with six ounces of water. At first the saliva became very frothy and alkaline, continued so for six hours, at the expiration of which time it was discharged very copiously, and found to contain acetic acid. Mitscherlich says that the reaction of the saliva is usually alkaline during a meal, and neutral or acid when fasting. This statement, which was first made by Mitscherlich,[1] has been confirmed by Marshall and Garrod. These latter observers are inclined to attribute this to the rapidity of the discharge during a meal, and the slowness with which the secretion is formed at other times. They found that ordinarily but two or three drops were discharged by one parotid gland in a quarter of an hour, and that was acid; but in half a minute after a morsel, reaction was neutral, and within the minute alkaline. This continued until twenty minutes after the meal, when it again became acid. *This is accounted for by the fact of the general acidity of the mucous surfaces of the mouth, which is sufficient to overpower the feeble alkalinity of the saliva when secreted in small quantity.*

Ziemssen,[2] in speaking of the acidity of the mouth in diabetes mellitus, says that the patient's *sense of taste* is commonly altered, being stale and clammy, and not infrequently, too, decidedly sweet, —the latter being due, probably, in many instances, to the presence of sugar, which, according to MacGregor, Nasse, Hetter, Lamperhoff,[3] is often found in the oral cavity. The transformation of the sugar into lactic acid is probably also the cause of the oral fluid in diabetics almost always showing an acid reaction. On another page the same authority, in speaking of the chemical alteration of the saliva during salivation, states that the saliva has been examined by many chemists,—Gmelin, Thomson, Simon, Ure,

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be neutral or even acid on account of free CO_2 (Oehl); its specific gravity is 1003 to 1004. *Salivary calculi* are formed in the ducts of the salivary glands, owing to the deposition of lime-salts, and they contain only traces of the other salivary constituents; in the same way is formed the *tartar* of the teeth, which contains many threads of leptothrix, and the remains of low organisms which live in decomposing saliva in carious cavities between the teeth.

[1] Landois and Sterling's "Physiology," vol. i. p. 291.

[2] Ziemssen's "Encyclopædia of Medicine," vol. xvi. p. 911.

[3] "In Karth de Dyscrasia Saccharina Diss Brown," 1840; ibid., vol. vi. p. 853.

Bird, Garrod, Lehmann, and Wright,[1] have worked at this subject. At the commencement of the flow the specific gravity is usually very much increased, being as high as 1059, while it hardly reaches 1010 in normal saliva. This increase depends upon a greater admixture of mucus,—the sympathetic saliva of the physiologists,—some albumen, and an increase in the salts. In the course of the salivation, however, the specific gravity falls almost down to that of distilled water. Wright found it 1001.5 in one instance; with the subsidence of salivation the saliva usually acquires its normal characteristics again. Its reaction is either normal, slightly alkaline, or it is neutral or even slightly acid, due to the increase of the already souring mucus.

Landois and Sterling,[2] in speaking of the abnormal constituents of the saliva, state that decomposition products of epithelium salivary corpuscles, or the remains of food, may render it acid temporarily, as after long fasting and after much speaking (Hoppe-Seyler). Even outside the body the saliva containing much epithelium becomes acid before it putrefies (Gorup-Besanez). The reaction is acid in some cases of dyspepsia and in fever, owing to the stagnation and insufficient secretion; also that in diabetes mellitus, lactic acid, derived from a further decomposition of grape sugar, is found (Lehmann). It dissolves the lime in the teeth giving rise to diabetic dental caries.

Foster[3] states that "the parotid saliva in man is clear and limpid not viscid; the reaction of the first few drops secreted is often acid the succeeding portions, at all events when the flow is copious, are alkaline,—that is to say, the natural secretion is alkaline; but this may be obscured by acid changes taking place in the fluid which has been retained in the duct, possibly by the formation of carbonic acid; . . . submaxillary saliva in man and in most animals differs from parotid saliva in being more alkaline and, from the presence of mucin, more viscid." Concerning the pathological aspects of saliva, Kingzett[4] states that the presence of lactic acid in saliva

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[1] See *Lancet* for 1841 and 1842; Marshall and Garrod's experiments in same journal; G. Owens Rees on saliva, in the "Cyclopædia of Anatomy and Physiology;" Simon's "Chemistry of Man;" the article on Lehmann's "Physiological Chemistry," in the *British and Foreign Medico-Chirurgical Review* for October 1851.

[2] Landois and Sterling's "Physiology," vol. i. p. 293.

[3] Foster's "Text-Book of Physiology," vol. ii. p. 362.

[4] Charles Thomas Kingzett, F.C.S., "Animal Chemistry." London, 1878 p. 53.

as been frequently asserted; but while there is great doubt about t, it is certain that during some diseases the saliva grows more or ess acid; thus, according to Donne,[1] saliva is acid in inflammatory ffections of the primæ viæ, in pleuritis, encephalitis, etc.

Wright assumes the acid state sometimes observed in saliva to e referable to, among other diseases, rachitis. But all these, and nany similar observations, are not worth much credit, being too ague, and admitting of no reduction to definiteness. It is also aid that lactic acid is to be found in saliva in cases of diabetes, but he statement has as often been contradicted.

Now, if Dr. Bogue, before experimenting, will wait until the rst few stagnant drops of saliva have flowed off, he will undoubtdly find that the reaction of the saliva *per se* is alkaline.

The experiments of Dr. Henry L. Chase, of St. Louis, are worthy f consideration. Dr. Chase experimented and tested the reaction f the saliva of more than five hundred different animals. In a etter published in the *Dental Cosmos*[2] of 1868, correcting the report f the Committee on Chemistry, he says, "In the paper, I stated hat I had found the mixed saliva of the mouth to be acid in early every person whom I had examined, being more than two undred; . . . that I had found in every case, in a minute or two fter a meal, the saliva to be either alkaline or neutral.

"That I consider a physiological condition of the mixed saliva o be either alkaline or neutral; that I found the saliva of the lower nimals, such as horses, cows, etc., to be alkaline, provided they ere living in a natural condition.

"That I found the saliva of cows, shut up where large numbers ere herded together in stables, to be acid."

There is nothing expressed in Dr. Chase's monograph, however, hich affords any good reason for assuming that the ingestion of cids, in medicinal doses, can in any way change the reaction of the aliva, although he makes the statement "that the saliva may be endered *sour* by partaking inordinately of acids;" but he gives no roof. In justice to Dr. Chase, I have quoted his letter of explaation, for it materially modifies some of the statements made in is paper.

I do not question the sincerity or the results of his experiments, ut I do question the method by which he obtained those results;

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[1] "Histoire Physiol. et Pathol. de la Salive." Paris, 1836.

[2] *Dental Cosmos*, vol. x. p. 547, "Character and Uses of the Saliva," read efore the American Dental Association, July, 1868.

for it must be observed that his experiments concern only the mixed saliva, and, of course, the first few stagnant drops, which, as I have already stated, are generally acid in reaction. If he will insert a fine canula into Steno's duct, and test the reaction of a small quantity of pure saliva, he will very probably admit that his paper, so far as it relates to the reaction of the saliva, is, to say the least, misleading.

Mention may be made of the bacteria theory of Miller[1] in connection with the disintegration of tooth-substance and the solvent action on their lime salts. Dr. Miller's experiments show:

1. "That fungi-bacteria constantly exists in the mouth, and especially in and around carious teeth, and as a resultant of their growth and increase a ferment-lactic-acid is produced.

2. "That these fungi can be isolated, their specific character determined, and their life-history studied.

3. "That artificial caries can be produced by placing teeth in a 'pure cultis' of these fungi, which cannot be distinguished microscopically from natural caries."

Dr. Magitot's[2] experiments are worthy of mention. He says, "It is perfectly established that dental caries results from the direct alteration of the organ by means of substances which originate in the saliva or are accidentally introduced,—an alteration usually preceded and favored by certain congenital or acquired predispositions of structure or anatomical conformation. Caries, regarded from this point of view," he says, "consists, then, precisely in a simple solution of the calcareous salts of the dental tissues by an acid element developed or brought in contact with them."[3] It would seem that this author places acids introduced into the oral cavity upon the same plane as those developed in contact with the teeth.

From carefully weighing all the effects that have been produced and all the doings that have been achieved in the matter, I am forced to conclude that the disintegration of tooth-structure in

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[1] Dr. W. D. Miller, Berlin, "Fermentation in the Human Mouth: Its Relation to Caries of the Teeth."

Thanks are extended to Dr. A. L. Northrop, New York, for the privilege of access to his valuable library.

[2] See monograph of George S. Allan, D.D.S., New York, "Caries of the Teeth: Its Prevention and Treatment." Odontological Society, New York, April, 1886.

[3] See remarks of G. V. Black, M.D., D.D.S., "Dental Caries," INTERNATIONAL DENTAL JOURNAL, vol. i. p. 749.

conjunction with a chemical hypothesis, may be summed up as embracing two points, viz.:

1. The direct action of acids introduced from without. (The complete disintegration by a mineral acid applied at the very spot where the erosion had its beginning has already been alluded to in the cases mentioned by Dr. Cameron.)

2. The lodgement of food and the presence of bacteria in out-of-the-way points about the teeth, followed by decomposition, fermentation, and the evolution of acids thereof.

One word regarding erosion in connection with the acid-mucus theory and the affinity which exists between acids and the enamel and dentine. The idea that erosion is probably due to the solvent action of acid-mucus, secreted by the follicles situated in the *labial mucous membrane*, was first advanced by Professor James Truman. This theory has, I believe, been accepted by Drs. Black, Kirk, and a number of other authorities; and to account for the erosion which is sometimes found upon the lingual surfaces and the distal points of the teeth, it has been held that the follicles at the tip of the tongue also secrete an acid mucus.

All my experiments relating to the effect of acids upon lime-salts of the teeth demonstrate most emphatically that the enamel is more susceptible to the influence of all kinds of weak acids than the dentine, and that invariably the enamel will first be attacked and destroyed. Not infrequently, however, in cases of erosion, we find the *dentine* on the grinding surfaces of the teeth scooped out, so to speak, leaving a hollow cavity, which is surrounded by a thin edge of enamel, which, if we assume the acid mucus is the cause, should have first been destroyed. I touch upon this point now in view of Dr. Kirk's experiments and for his future consideration when studying the etiology of erosion and the cause of the acidity of the mucous follicles of the mouth.

Notwithstanding the objectionable features of the tincture of the chloride of iron,—viz., its peculiar and obnoxious taste, its liability in many cases to excite nausea and vomiting, and its extremely acid and astringent properties,—it is frequently employed by physicians, not only in the treatment of anæmia, but also in large doses in the treatment of erysipelas, neuralgia, diphtheria, epilepsy, acute rheumatism, and other disorders which might be mentioned. It acts also as a diuretic; even in ordinary anæmia many authorities prefer it to any other preparation, claiming that its effects are shown much more quickly, and that it seems to act more satisfactorily. Almost all agree that it possesses special vir-

tues, either constitutional or local, which render it useful in the above-mentioned disorders. These peculiar properties (especially the diuretic effect) are ascribed by some to a peculiar ethereal compound, resulting from the mixture of the *liquor ferri chloridi* and the alcohol used in making the tincture, to which compound its odor is due.

As I stated in the beginning of this paper, the SYRUP OF IRON CHLORIDE is simply the tincture of the chloride of iron in a slightly modified form, a sufficient quantity of alkali having been added to counteract the free hydrochloric acid, and a small quantity of the syrup of gaultheria (which, it is claimed, in certain disorders, has a therapeutic value), to render it more palatable. In other words, the excess of acids over and above that necessary to form a perchloride of iron has been eliminated. The preparation is, therefore, acid in reaction; but the relative proportions of the acid and iron have been adjusted so delicately that, although sufficiently acid to prevent the precipitation of the basic salts of iron, it is not enough acid to injure the enamel of the teeth. And it is to be noted that, while the teeth are protected from injury, as soon as the preparation passes through the mouth into the stomach it meets with more hydrochloric acid,[1] and is likely returned again to its original condition, or nearly as it was in the original tincture of the chloride;[2] accordingly, it may be said that the therapeutic value of the syrup corresponds with that of the tincture. Moreover, it is claimed that the syrup as a restorative agent is easily assimilated and more likely to be tolerated by the mucous membrane of weak stomachs than the old form of the *acid chloride*, and is less harmful under prolonged use.

It is not claimed that all of the objectionable features of the tincture have been removed. For instance, the syrup possesses the same special and styptic qualities as that of the tincture, and it necessarily follows that there will be a correspondingly physiological effect produced on the mucous membrane of the bowels. It will be necessary, therefore, for the physician (as when using the tincture) to pay proper attention to this particular functional disorder.

It has been observed by Dr. Dana, of New York, when administering the syrup of iron chloride to children (when tonic remedies and supporting measures of treatment were indicated),

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[1] It is supposed that hydrochloric acid is produced in the stomach by a reaction between the chloride of sodium and lactic acid.

[2] See Professor Elliott's remarks before New York Odontological Society, INTERNATIONAL DENTAL JOURNAL, August, 1891, p. 554.

that the tongue of the patient was less likely to be discolored than when the tincture was employed; and he has been enabled to more clearly define the presence of sordes. It is not claimed, however, that the *syrup* will not discolor the teeth. In reference to the latter, the same may be said of soft-boiled eggs and the various kinds of salad-dressings; but in all cases after the discoloration has been removed, the enamel and structure of the teeth are found to be intact.

The following cases have been reported to me by physicians who have employed the preparation in their practice:

Case I.—By Dr. Cyrus Edson, chief inspector, Board of Health, New York City.

Mrs. P., aged thirty-eight years, came to me suffering from a severe attack of anæmia and sciatica. She had been troubled with sciatic pains for four months previously, and although she had been under treatment by three other physicians, she had obtained no relief.

The etiology of the sciatica, as far as could be ascertained, was the history of severe grief, due to the loss of her son. I gave her an aperient (cascara sagrada) morning and evening, also ordered Weld's tincture of chloride of iron, to be taken three times a day, after meals, in four-drachm doses.

It is now one month since the last consultation. All pain has completely disappeared, and her blood is in excellent condition.

Case II.—Mr. C., age thirty-seven years; physical condition about the same as the patient in the previous case, though of much longer standing.

He has been troubled with sciatica, associated with anæmia, for about three years, but it is only within the last year that the pain has been continous.

I made use of subcutaneous injections of *aqua pura* along the course of the sciatic nerve; and also to improve the condition of the blood, Weld's tincture of iron.

The patient has been under my treatment for about a month, and complains now only of slight intermittent pain during the night. Physical appearance much improved.

Case III.—G. C., a child, eight years old, residence, Tremont, New York City, had a very bad attack of malarial fever followed by *anæmia*. I put him on Weld's tincture of iron, with the result of a decided amelioration of all the symptoms within two weeks.

In all the above cases the patients experienced no trouble in taking the preparation, and the teeth suffered no deleterious effect.

As far as my experience extends, I can say that Weld's preparation contains all the advantages, without any of the disadvantages, of the officinal "tinctura ferri chloridi."

Case IV.—By Dr. H. B. Bayles, sanitary inspector, Board of Health, Brooklyn, New York.

Mr. B. was taken with a chill on September 4, 1891, with slight elevation of temperature. The condition of moderate fever continued for several days, and developed, as was expected, into what was supposed to be a mild case of typhoid fever. In due time the eruptions occurred, and, aside from general debility, he did not complain of any very annoying symptoms; no profuse diarrhœa; in fact, being what might be termed comfortably sick.

This state of affairs continued till the sixteenth day of his illness, when he was attacked with epistaxis (not profuse); the next day there were extensive purpuric spots over the entire body, hemorrhages from the tongue and gums, and copious hemorrhages from the bladder. The temperature remained at 100.5° F., the pulse at 124,—the patient completely exsanguinated and in a critical condition. This state of affairs continued about one week. The treatment consisted of stimulants, heart tonics, and tinctura ferri chloridi. The iron was given in moderate doses and frequently; but the stomach, heretofore manageable, became rebellious, and rejected it. When the old reliable preparation of iron had to be abandoned, I considered my mainstay gone. Having the same day received a large bottle of the modified tincture of iron, prepared by Parke, Davis & Co., after the formula of Dr. G. W. Weld, of New York City, I immediately gave the same, commencing with one tablespoonful, and increasing to three tablespoonfuls every two hours. This preparation was tolerated by the stomach, gave rise to no nausea, and was taken continuously in varying doses for several weeks. I had the extreme satisfaction of seeing my patient restored to perfect health, and to learn that the old reliable tinctura ferri chloridi had been so modified that its greatest drawback had been removed, and that it was rendered an agreeable preparation.

Case V.—By Dr. A. H. Dana, New York City.

Louis L. had been suffering from typho-remittent fever for a period of five weeks. As usual in such cases, he was very much debilitated and in an anæmic condition. His stomach at the end of the fourth week was extremely irritable, and he was unable to retain anything in the way of food or medicine. Iron in some form was indicated. I used a number of preparations without success

Having had my attention drawn to the syrup of iron chloride, I immediately prescribed it, giving him five tablespoonfuls each day. The effect was immediate: his nausea ceased, the digestive organs resumed their normal function, and he rapidly improved and regained his health.

I have since prescribed this preparation in three other cases with equally gratifying results.

FROM R. A. CALDWELL, M.D.

"24 West Thirty-second Street, New York City.

"I have used the syrup of iron chloride with gratifying results. I believe it will prove a most valuable and permanent part of the armamentarium of our profession."

"15 West Thirty-seventh Street,
"New York City, December 30, 1891.

"G. W. Weld, M.D.:

"Dear Sir,—Permit me to say that I immersed a tooth, with perfect enamel, in the 'syrup of iron chloride,' for a period of two hours, and so far as I can see, the enamel has not been affected in the slightest degree.

(Signed) "George A. Allan, D.D.S."

FROM PARKER SYMS, M.D.

"55 West Thirty-sixth Street, New York City.

"The syrup of iron chloride possesses valuable points."

"WE SPECIALISTS."[1]

BY RICHARDSON GREY, M.D., EAST ORANGE, N. J.

Mr. President and Gentlemen,—In accepting an invitation to read a paper before your society I did not anticipate the difficulty I should meet in attempting to fulfil my promise. In writing a paper to be read before a special audience there are two points to be considered if any degree of success is to be attained. The subject must be one with which the writer is well acquainted, and it must also be one in which his hearers have some interest.

You can readily appreciate the difficulty which has confronted me in observing these two essential points in complying with an invitation to address a dental society. Twenty years spent in

[1] Read before the Central Dental Association of Northern New Jersey, April 20, 1891.

medical study and practice make a subject in general medicine most agreeable to my own inclinations; but such a topic would have a very limited interest for you. It has been my fortune to be intimately associated with dental men in their practical work in the office for several years, but as an observer only.

The border-line between the work of the specialist in throat-diseases and the dentist is more sharply defined than would be supposed at first thought. For instance, in looking into a patient's throat the teeth are in full view, and yet I must confess that I do not often notice them. An artificial denture even escapes my attention unless it falls down and interferes with my work. And how often does the dentist see the tonsils which probably come into his view every day? The antrum of Highmore has sufficient interest to both of us to justify an article, and it was my original intention to use it for a subject. New developments in this direction have put a new phase of its discussion before us, but all that can be said about translumination has been so recently reported that it cannot be repeated to advantage at this time.

Taking these things into consideration, my mind was turned from the border-line of medical and dental practice into another channel. I am myself a specialist in medicine, and in the medical profession specialties are more important as the years go by. Moreover, echoes of certain articles read in dental journals were floating through my memory. The impression left on my mind by these wordy arguments as to whether dentistry is a specialty in medicine or a profession *de novo* is not clear as to the *casus belli.* Therefore let me say just here that it is not my intention to say anything on this subject, and, exercising whatever privilege the writer of an article may have to limit its scope, a taboo is rigidly placed on that subject at this time.

The time has gone by when the usefulness of specialties can be questioned. In all the arts, sciences, and professions the microscope is an important adjunct. Nothing but good can come from the minute and close study of any subject worth studying at all. The benefit is not only directly to the afflicted who seek relief, but also to those who practise, for with the advance of the specialty idea no one can hide ignorance under the cover of general knowledge and abstract statements. It is not the usefulness of specialties that is brought under discussion now, but their limitations. To what end are specialties to come? How fine are the subdivisions to be? Are we to have specialties within specialties, on the *imperium in imperio* style?

The eyes offer a wide field for study and special skill, but the ears have always been compelled to take a secondary relation to them. How long will it be before some man will give the ear its proper place as a separate specialty?

The air-passages present a range of diseases sufficient to fully occupy the whole time of any man in study and practice, and yet are limited to an extent that permits the average mind to master the subject thoroughly and retain the knowledge from year to year. Are we ever to have men announcing themselves as specialists in the tonsils? The fingers and toes offer a fairly good field for æsthetic and humanitarian practice, and it has, indeed, been filled in a certain way. But my curiosity has been often excited as to the outcome of manicure and chiropodist practice. It seems to be tending towards an evolution into something higher than it is now, and when this advance comes, will we see men graduating in medicine and announcing themselves as specialists in this branch of practice, or taking a brand-new degree of Doctor in Manicure and Chiropodist Work?

Now, while these are merely imaginary results as yet in medicine, the dental profession presents us with an actual instance of what we have been considering. There is at least one item in dental practice which has claimed the dignity of a specialty. There may be more, but this one will serve for illustration. Attached to dental cards in the public print this legend may be sometimes seen: "Gas a specialty." I have often wondered what the exact meaning of that phrase is, and it is still an unfulfilled intention on my part to make inquiry about it at some favorable opportunity. Imagination, however, has been busy meantime, and many solutions have presented themselves for recognition.

Does Dr. Blank, who makes gas a specialty, mean that he has a special way of administering gas which is an advance on the usual methods? Does he mean that the gas used is specially prepared for him, or is his own special preparation? Does he mean that he has made a special study of gas and its use, so that he is better qualified for its administration than dentists usually are? Or does he mean that he is one of the few dentists who use gas at all?

If the mercy shown to those who make voluntary confession will be extended to me, and hoping that it will be, let me confess to you that the suspicion has sometimes forced itself upon me that, after all, this announcement of "gas a specialty" is something of the character of the agent used.

And yet—forbear with me—I also am a gas specialist! The years spent in "assisting" in the administration of nitrous oxide certainly entitle me to claim the distinction of special attainment, and, without a taint of self-exaltation, I can say that, as well as any man living, I know how to attach the necessary apparatus to the cylinder so that it shall not leak; I know how to turn the valve so that sufficient gas shall be liberated for the use of the patient, and the bag not burst; I know how to support the weight of the apparatus so that it shall not be unduly hard for the operator to keep the mouth-piece firmly over the face; long experience has made me perfect in avoiding the vent through which malodorous exhalations escape from the patient's lungs with each expiration; and last, but not least, I have especially learned to close the valve of the cylinder when the operation is completed, so that the small margin of profit from the gas given to the patient may not be lost by leakage from the cylinder. This is comprehensive, but it does not include the mental process going on, as it were, in pursuit of the gas as it enters the patient's lungs; the changes it causes and those through which it itself passes; the resultant exhalations, chemical formulæ; in short, all that vast store of knowledge which does not appear to the onlooker, present nevertheless, but not important to the patient nor vital to the operation. Now, having made so full and honest a statement for myself, may I ask my friend what he means when he announces "gas a specialty"?

When one has reached such a lofty plane of knowledge and experience in a specialty as has been just described, he begins to learn something of what it means to be charitable to those not so well informed. In reading dental journals I am sometimes grieved to find articles in which the writer holds up to ridicule general practitioners in medicine, because they have been found to be densely ignorant in dentistry when weighed in the balance of the severe critic. Now, leaving out the inquiry which might be justifiable as to what reason can be given why a medical practitioner should know more about dentistry than about ordinary carpenter-work, for instance, I have never read these statements without wishing that the lack of charity displayed might be corrected by a high grade of special knowledge. How often have such thoughts chased each other through the by-ways and avenues of my cerebrum while I have been assisting a gentleman duly authorized to put after his name the cabalistic letters signifying that by the grace of the State of New Jersey he is at liberty to pull teeth as a dentist. With the first snore from the victim, or, that failing, as it

sometimes will, by sundry punches in the eye, or by raising an arm and letting it fall at the imminent risk of breaking a bone as it descends upon the arm of the chair, the moment that full "gasphyxiation" has arrived is decided. The inhaler is dropped and the operator plunges into his work of extraction. Suddenly, in a most unmistakable manner, the patient makes known the return of consciousness; while the operator, his work unfinished, exclaims petulantly, "Pshaw! how fast he comes out of the gas!" My soul, sitting serenly in the exalted attitude attained by special knowledge, murmurs in echo, "How fast!" We specialists are nothing if we are not charitable.

But there is a serious side to this specialty question which deserves all the time that can be given to its discussion. The first point for consideration is as to what, properly speaking, may be said to constitute a specialty. There is a use made of the word which, whatever argument may be advanced in its favor from a philological stand-point, cannot be recognized as expressing the idea of a specialty, as it is now generally understood by professional men. In my preceding remarks I have attempted to ridicule this erroneous idea. This is a use of the word which has, in the past, been the basis upon which the prejudice against a specialist has been founded. In that sense specialist and quack are synonymous, and it is a matter for regret that this prejudice has not entirely disappeared from professional ranks.

My own conclusion as to what may properly be called a specialty is this: Any organ, or group of organs, may be said to be a proper field for a specialty, in the broad sense of the word, when it furnishes in itself, in pathological conditions, sufficient material to fully occupy the time of a man who devotes himself to a study of its diseases and the application of remedies to their relief. It should be possible also for a man of ordinary ability to master all the details of principles and their application to that particular subject, and by mastery of details is not meant that mental congestion so often observed in students when they appear for examination. It has been commonly remarked that a medical student, and possibly it is true of the dental matriculate also, knows more when he graduates than he ever does after. Mastery of details means that mental assimilation which makes the knowledge part of the man, so that he can at any time take up any feature of the subject without needing to refer to authorities. It is positively refreshing to meet such a man and hear him speak on his specialty.

It is evident that medicine, as taught in the seven branches

necessary for graduation with the degree of M.D., is too vast for any but a phenomenal mind to master and retain in details. This is now fully recognized in the post-graduate schools where the special branches of medicine are taught, and attention to minute points is given to supplement the general teaching of the college.

My observation of dentistry leads me to think that it does not labor under the disadvantage of comprising too vast an amount of material for mastery by an individual, and therefore it is, in the broad sense, a specialty. This statement is not intended to convey an invidious meaning, and has no reference to dentistry in its relation to medicine or anything else. Am I wrong in saying that the average man can—not easily, as some would seem to suppose, but by diligent application—master dentistry in its details, and yet not have so vast a store of knowledge that he cannot carry it into practice without being unduly burdened, or becoming too top-heavy for satisfactory progress in the work? If this be so, there cannot be, in a legitimate sense, a specialty within dentistry. The dentist who is not master of his profession in all its phases is without excuse. He cannot plead ignorance, for there is no excuse for ignorance. He should not consider himself qualified for his profession because he can put in a gold filling as well as any one else. It is positively disheartening to hear men talk as though they were everything that any dentist can be, because they can pull a tooth or put in a good filling. If that is all there is to dentistry, would it not be a mere trade?

There are important principles underlying every detail of dental work; there are pathological processes going on in the tissues with which the dentist deals; there are more things than the macroscopic vision can see; and these things are of essential, even vital, importance to the best work. The man who is not qualified in these respects will quarrel with this, and claim that his fillings are just as good as can be done, and that teeth never go back on him. But, then, mistakes never happen to the ignorant. Physicians in general practice do undoubtedly often put drugs into the stomach without knowing why they do so; but if dentistry is in this broad sense a specialty, a dentist should never put medicine into or around a tooth without knowing why he does so.

Being myself a specialist, I hold out a hand of welcome to a dentist as being a fellow-specialist. My purpose in these remarks is not to read any one a lecture, but to stimulate us to greater proficiency. Five years of special work, following fourteen of general practice, have demonstrated to me its value, and I am desirous that

we shall maintain so high a standard that the demonstration shall reach all classes.

There still remains for consideration the broad question of the status of the specialist. In medicine it is now demanded that a man practising a specialty shall first receive the degree of M.D. In fact, the medical profession have always demanded this; but in these latter days the State is interfering in this matter, and aiding the profession to give the man who claims to be a specialist in the proper sense protection from the quackery which has gathered about the idea in the past. There was a time when the profession expected that a man would give some practical attention to general medicine before entering upon his specialty, but that seems to be changing now.

The point of most importance in this connection is, that while the profession keeps so close a hold of the man up to a certain point, it then withdraws at the most critical time. There is an utter absence of control over the man who enters upon the practice of a specialty as to whether he is properly qualified for that branch. Take the eye, for example,—a most important and, at the same time, delicate organ. If one makes a mistake in treating it, and then is compelled to remove it, the artificial eye will not in any sense take the place of the natural, and it would be impossible to persuade the patient that it was superior to the one removed; that it would not be troubled by dust getting into it, for example. A man receives his degree of M.D., and decides to make the eye his specialty. The stock of knowledge of this organ which he brings with his degree is very limited and must be increased. He studies, but it is the business of no one to find out how well he studies. The broad foundation has been carefully laid under proper direction, but the superstructure has had no superintendence. He may be well or ill prepared, who knows? I was about to say, who cares?

Theoretically, the degree of doctor in medicine covers the practice of every organ in the human body; but when it comes to special work in one organ, or any set of organs, there is found one instance, and one only, in which any degree of supervision is enforced. In connection with the teeth alone is there an assurance demanded that qualification exists. I have myself tested this matter and know it to be so. The registry of a medical diploma does not suffice, unless the special declaration of dentistry is also made. Now an advanced step has been taken, and examination takes the place of declaration. This is as it should be, and I for one am not complaining. I would like to see the same hedge raised

around every organ of the body that is made a special subject for practice.

On the other hand, a man cannot treat specially any part of the body without first laying a broad foundation of knowledge of every other part, with one exception again. He can be licensed to treat the teeth although his previous education has been so limited that it has not passed the rudimentary stage. Please do not understand me as saying that all dentists are uneducated. My meaning simply is, that while the hedge has been raised about dentistry (and this I believe to be right), very serious gaps have been left which should be filled, as doubtless they will be. In justice to the mass of dentists, this also should be said: that the ignorant, uneducated man who secures a license to practise dentistry cannot be a specialist such as has been described, nor properly represent the dental profession.

We are drifting along in this matter of professional education just as the currents of circumstances may chance to carry us, and it does seem as though the twentieth century should witness the inauguration of some plan by which there should be systematic, thorough, and universal teaching, so that from the time a boy takes up his letters to the time when he takes up his life-work there should be systematic intent, and at every important stage he should be called upon to prove his competency up to that point. To some extent it is done, but at vital points there is omission. This is one of the benefits "we specialists" receive from the microscopic study of a subject, that we appreciate more and more the blessedness of thoroughness.

A CONSIDERATION OF SOME OF THE RESPONSIBILITIES OF DENTISTS AND PHYSICIANS.[1]

BY LYMAN F. BIGELOW, D.M.D.

Just how far dentists and physicians are legally responsible for benefits conferred and injuries done to patients by failing to do all that should be done, or by doing for them operations based on unsound judgment and unskilfully performed, is something we, as members of one profession, are not allowed to decide for ourselves, but are at times forced to meet members of another profession and

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[1] Read before the Harvard Odontological Society, June 25, 1891.

be passed upon by them. Though justice is not always obtained by such procedure, the very fact that protection may be sought from an outside source has, I believe, a restraining influence on the more powerful classes.

The tremendous advantage the professional man has over his clients, be he dentist, physician, or lawyer, is, it seems to me, unequalled by the advantage a man of any mercantile calling has over his customers. It is true that syndicates and trusts are formed, and prices, it sometimes seems to appear, are unjustly inflated. Yet the alternatives for the consumer are much greater than those of the person who places himself in our care for advice and assistance. The people who confidentially disclose their aches and pains to the dentist and physician are placing themselves in very intimate relation with their advisers; and we as advisers are in a very responsible position.

We receive patients for the first time, and from the moment we begin to make an examination to the final service rendered with subsequent advice we are in a most responsible relation to the patient, and this does not cease at the close of a given set of operations. We are in a measure accountable for the future comfort and pleasure of our patients so far as comes within our province. It is perfectly easy to conceive of a case where, by a poor appreciation of existing conditions and poor judgment of the possibilities, we may make one's future full of unpleasantness without the opportunity of ever making their condition as satisfactory as it might have been had we been better able to judge and advise. We all see cases which seem to show a lack of just the qualities I have intimated we should possess.

We are responsible morally so far as we have capacity to acquire knowledge and skill. It is not possible for some of us to weigh as accurately as others the case in all its bearings, past, present, and future, yet we do it with as much conscientiousness as though we had all knowledge, and morally we are doing our duty; but, as has already been said, we are not permitted to determine for ourselves what we shall or shall not do from the legal stand-point, and, as we all know, members of our profession have been obliged to defend themselves in court against serious charges, perhaps just, perhaps unjust.

From Wharton and Stillé's "Medical Jurisprudence" I quote the following: "According to Casper, malpractice is imputable in cases where the practice adopted is in conflict with general rules prescribed for similar cases by contemporary medical science, and

adopted in contemporary medical experience. By Saxinger this definition is objected to because it cannot be applied in many cases of malpractice, and because there are no general rules applicable to every case. The physician, he argues, would be compelled, if this standard were made obligatory, to surrender all independent activity. But in any view it must appear to sustain process against a physician for malpractice to show, first, that the injury to the health or body resulted from bad treatment of the case by the physician; second, that this evil result might have been foreseen and avoided by a competent practitioner, and, further, dentists are subject to the same conditions of liability as are other practitioners, and the patient cannot recover for a mistake into which he himself led the dentist; that the service was gratuitous is no defence to a suit for negligence."

You have heard the quotations from a legal authority concerning the responsibilities of physicians and dentists, yet it seems hardly safe to allow that the general rules governing the practice of many men of our profession are safe rules for those to follow who have at heart the greatest good for their patients.

For instance, we often hear (perhaps not in our offices, but outside) people say that their dentist or physician would not extract a tooth until the inflammation was reduced, or that no treatment could be given teeth in such condition that would get them into a serviceable and comfortable state, therefore, recommend extraction. Is not this quite a general practice? But, in the first case nature is trying to throw off an irritating substance, and if extraction is indicated by other conditions, it is, as a rule, just the proper time to extract; while in the second case we are all familiar with teeth that have been, for a long time, in the condition of Vesuvius smouldering within, only waiting for right conditions to prevail when they will throw off the products of that fire; even where eruptions have taken place at very frequent intervals, we have been able to control conditions, put the member in a comparatively passive and useful condition, and avoid extraction. It therefore seems we are justified in violating some of what seem to be general rules of practice of many contemporary with our own time.

In the country, physicians are often called upon to relieve pain arising from a diseased condition of the teeth; and from reports that are made, it would seem that their appreciation of the value of these organs is not what it should be to properly fill the requirements of a general practitioner. They seem to forget, too, that there are

those to whom patients of this class might be referred who have made diseases of these organs a special study, and are better able to prescribe than they. How often do we hear of physicians giving long courses of treatment for neuralgia that short operations of the dentist have seemed to entirely cure; not that the dentist has marvellous power, but that the physician failed utterly in his diagnosis, or possibly that he did not care to acknowledge that another might be able to do what he could not.

I wish to cite two cases, not to show that in either were the parties, according to common law, responsible, but to bring to your attention the fact that physicians and dentists, as a rule, are too poorly qualified to deal with conditions that are constantly being presented, and that dentists, especially we younger members, should be extremely careful in making recommendations and performing operations, that we may not do serious injury to our patients, nor reflect unpleasantly on our professional brothers.

First, that of a young lady, about twenty-one years of age, who had been a patient of a well known dentist of Boston, but it being quite inconvenient for her to reach him, she consulted another, and received treatment from him which she has described in the main as follows: He examined her teeth and recommended the removal of the pulps of the left superior first bicuspid and right inferior first molar, and that it might be necessary to do the same with both superior first molars; that both superior second bicuspids be extracted, giving as his reason that it would be necessary for him to do this, as the teeth were in a badly diseased condition, saying also that he could not get at the molars next to them to fill unless the bicuspids were removed. He diagnosticated the condition of the teeth that were to have their pulps removed, and those that were to be sacrificed by extraction by grasping them between his thumb and forefinger and moving them from side to side, claiming that the movement was sufficient to indicate a badly diseased condition at the apex of the roots. He extracted the teeth condemned and removed the pulps from those mentioned as requiring such operations, treated and filled them. So far as I have been able, from close questioning of the patient and an examination of her mouth and teeth soon after the operations were performed, as well as an examination of the teeth that were extracted (they being brought to me by the dentist himself), I could not possibly imagine such a diseased condition of the teeth as he personally told me did exist and yet find her mouth so exceptionally good so soon after.

The teeth were extracted at the first sitting, and the indignation of the young lady's parents was very great, they and she preferring to undergo almost any treatment rather than lose a tooth by extraction.

During the process of pulp-removing and filling, which was heroically done, he making no application to destroy the life of the pulps, the patient suffered a great deal, being unable to sleep on the nights following the removal of the pulps, and was in an exceedingly nervous condition. The dentist told her she must endure the pain, and also said she would not have as much if she remained in the house evenings and did not dance so much, with other equally strange things. Fortunately or unfortunately for me, she came for treatment at the suggestion of her sister and mother, I, however, telling her that I thought she had better rest awhile before undergoing any more dental operations, thinking that her trouble might be imaginary. When she came to me she described trouble in the bicuspid that had been treated. Upon removal of the filling in the crown and pulp-chamber I found the root unfilled. Ventilation and the treatment given have made it comfortable. I have recently been treating the molar that was devitalized and left in a similar condition, and have given some relief.

Each one of us has his own particular methods of manipulation. These we have a perfect right to. We have individual discriminating power. This we are heir to, and we can cultivate it and perfect it in a great or small measure, and the more it is cultivated the greater do the responsibilities and possibilities become. In the case cited there was seemingly a lack of this power, or (which I do not like to think) that advice was given and operations performed without the best interest of the patient at heart. It is a peculiar case in all its bearings, and the conversations had with the dentist make it appear even more so, it being impossible for me to dissect his language sufficiently well to get at just what he did mean.

The second case I wish to cite is that of a clergyman who applied to a physician in the country for relief of aching teeth, he locating the origin of his trouble in the right superior bicuspid region.

He had been kept awake several nights, and was becoming very much exhausted. The physician made a slight examination of his mouth, and finally extracted the tooth indicated by the patient, who wished him to remove it. His troubles were not in the least abated, but, on the contrary, from disappointment at not

etting relief and the soreness of the wound thus made, they were ultiplied.

Very soon after, I saw him and located the primary cause of his uffering in the right inferior third molar, it having an exposed ulp. The instant I touched the pulp, he declared it to be just vhere the pain was, though, before looking into his mouth, he escribed to me the ache as being in the right superior bicuspid egion. He was greatly surprised, but you are not, and I was not, or we all have often seen similar cases. I made an application hat relieved him almost immediately, and subsequently treated nd filled the tooth.

From these two cases, that have very recently come under my bservation, I have learned a very valuable lesson, and the responsi-ilities of our calling were brought vividly to my mind. In the rst, that of the young lady with ample means at command and a isposition to have her teeth and mouth kept in as good condition s possible, ready to make and keep appointments with the dentist o whom she applies, with all confidence in his ability and judg-nent, surrendering herself to him with the understanding that he s to do for her just what should be done for her best good, the oss of these pulps and the removal of the two bicuspids that she leclared had given her no trouble is a serious matter with her.

In the case of the clergyman, who was anxious to rid himself f suffering even at the expense of a tooth, if it were necessary to do o, imagine his vexation when his troubles continued after the loss f the tooth he supposed was causing the pain. A tooth to a man vith such prospects in life as has this one is of infinite value; one vhose calling is such that he is constantly before exacting audiences nd whose every intonation is as sharply watched as to its merits s what he may say, feels the loss greatly, especially as it seemed o be utterly unnecessary. And yet, according to the authority uoted, there is no redress for him, it being true that he led the hysician to make the mistake.

Were I to suggest any way to protect the professional man as vell as his patients, it would not be in the nature of enacting more tringent laws regarding the penalty for misjudgment, but it would e, possibly, to require those intending to practise general medicine o acquire much more knowledge of the diseases of the mouth and eeth; possibly even better, to suggest that physicians confine hemselves to relieving pain of aching teeth by other means than extraction, and referring such patients to the specialist.

So far as dentists, as a rule, are concerned, we should possess a

much broader general education, a very much deeper knowledge of our specialty, and a good knowledge of general medicine, not that we are to practise it as such, but that we may grapple with cases that come within our province, and which are sufficiently numerous and perplexing, with a firmer and more accurate conception.

Institutions that profess to give young men this special professional education should, I believe, require not only a fair general education, but a liberal one, and, before graduating and assuming the responsibilities they must later face, students should undergo a much more comprehensive examination.

BICHLORIDE OF MERCURY IN DENTAL PRACTICE.[1]

BY DR. GEORGE S. ALLAN, NEW YORK.

As to my employment of mercury bichloride, I would say that for some years past I have used it more freely than is customary in the profession, and with much satisfaction.

There is little doubt in my mind that it is one of the most powerful germicides we possess; that its use is not attended with any special dangers, and that most of the objections that have been urged against it are largely fallacious and misleading, and due to a lack of knowledge as to its properties and combinations.

In the last year there have been several notable articles in the journals relating to the subjects of infection, disinfection, sepsis, asepsis, and sterilization of dental instruments. They all lay stress on the importance of the subject, and the great danger that a lack of proper care and attention may entail. Their general drift may be summed up in brief: that sterilization of instruments, etc., is necessary, and, in a measure, obligatory; but that ways and means are not easily attainable, and in some cases not at all.

Dry heat is the most efficacious means to employ to destroy germs, and they fall back on the oven at about 300° F. as the best attainable method to adopt.

To all this I have no special objections to offer other than the manifest one, that it does not meet our wants. Dry heat will

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[1] Remarks made at the Twenty-fourth Annual Meeting of the American Academy of Dental Science, Boston, November 11, 1891.

stroy germs most assuredly; but who can afford to keep his struments in the oven half the time, or give it the requisite care d attention? Who can afford the large number of duplicates re- ired where certain instruments are not only in daily but hourly e, and are picked up, maybe, a dozen times or more a day, let alone e complete failure of said means to meet the case of the mouth- irror, syringe, etc.?

What the dentist wants is something always ready, available, d efficient. If he cannot stop to cook his instruments, he can ke the time to wipe them clean and dip them into a cup or dish ntaining a germ-destroying fluid.

I have, then, mercuric bichloride on my shelf in a bottle, con- ining a one-per-cent. solution. When wanted, I prepare from this solution of the proper strength, one to one thousand; but instead water I take rose-water. The bichloride solution simply has a ery disagreeable taste; but if a mixture is made of one-per-cent. lution bichloride and rose-water, in proportion of one of the rmer to nine of the latter, you have an equally efficient prep- ration, and the nasty bug-poison taste of the simple liquid is pplanted by an agreeable rose-flavored one. This, then, is the ixture the use of which I advocate.

Into this fluid I freely dip any or all of my instruments, and as eely pass them into the mouth and around the teeth and gums. he instruments are never injured by the operation, and are easily ept clean. All instruments that have been dipped into water and iped clean and dry can have only a thin layer of germs attached them, and these will be reached at once by the solution and estroyed. I also constantly dip my mouth-mirror into the same uid, and find that it is in no way injured by it; on the contrary, ll parts of it are kept the brighter and sweeter. My syringe, a etal one, is also kept in good condition by its use, and I find now hat patients, instead of asking me what the nasty stuff I have in he glass is that I have washed their teeth with, wonder where the elightful rose-taste comes from.

In cleaning teeth I dip the steel scalers of all descriptions and izes constantly in the fluid, and then apply them to the necks of the eeth, and feel certain it is a beneficial operation. Infection can be arried from one part of the mouth to another, but by this means all anger is averted.

I have repeatedly noticed the rapid and healthy healing of the ums and soft tissues, after extended and even painful lacerations, esulting from this operation.

The instruments I exhibit—scalers, scrapers, mouth-mirror, and syringe—have been dipped into the solution hundreds of times, and, as you see, show no indications of other than ordinary use.

I would add that the rose-water solution is equally valuable in case you desire to cleanse and wash out a pocket or an abscess, and your patients will thank you for giving them so agreeable a taste in their mouths, instead of the ordinary disagreeable one.

In preparing the solution, you must not forget that plain bichloride decomposes; and even if you employ a freshly-prepared solution, you fail to get the best effects, owing to the albumen-coagulating power of the agent. Common salt in equal proportions with the bichloride is efficient; but probably the tartacid sublimate tablets are about the most quickly available and efficient condition in which to keep the article. One of these tablets mixed with a pint of water makes a one to two thousand solution. Apparently this solution does not change, and does not coagulate albumen.

Another tablet is composed of ammoniac chloride and mercury bichloride in equal proportions.

HYDROGEN PEROXIDE IN DENTAL OPERATIONS.[1]

BY DR. D. D. PEABODY, STONEHAM, MASS.

Mr. President and Gentlemen,—It was with much diffidence that I yielded to the call of your committee to prepare a paper on any subject for your consideration, because of the feeling that many another could better employ your time; and I consented, only hoping that some suggestion that I may offer may help to lighten the labor and augment the success of some one listening.

Perhaps no problem at present more absorbs the attention of those who have to deal with pathologic conditions than the securing of complete asepsis, and the desirability of accomplishing this result without the complications arising from the use of irritating and, frequently, toxic agents. The last quarter of a century has witnessed no greater advance in medical science than along this line. Those familiar with the scenes in hospitals during the late war recall with a shudder the many brave lives that went out through gangrene and kindred conditions that refused to yield to

[1] Read before the New England Dental Society, October 29 and 30, 1891.

he then known and accepted treatment. To-day hospital gangrene is almost unknown, and the similar sloughings and ulcerations have disappeared under the beneficent influence of the antiseptic treatments in common use. As a dental student I was led to believe that most of the septic conditions we are called to face could best be controlled by the use of carbolic acid, creosote, or mercuric chloride; and we can all recall with regret the persistent abscess that ought to have healed, and the putrescent roots that ought to have become sweet and healthy, under their application, and they *would not*. Now, you probably expect me to bring out a hobby, but I am not aware that I have one. I am glad, however, to speak at this time of the satisfaction to be derived from the use of hydrogen peroxide (H_2O_2) in many of the various lesions we are called upon to treat in dental surgery. To be effective this agent should contain at least twelve volumes of oxygen to one of water; and as the oxygen escapes or separates from the water as freely as the carbon dioxide from the bottle of ginger ale, it must be kept closely stoppered and not allowed to remain at a temperature above 65° or 70° F. It is better to procure it in four-ounce or eight-ounce cork-stoppered bottles, for ground glass will blow out, and even the corks must be tied in, and should be renewed by fresh ones occasionally, for the efficiency of the oxygen lies in the fact that it is a destroyer. Keep such a bottle in a refrigerator or cool cellar, and use from a small bottle at the case. It is better to shake the large bottle forcibly before opening, to recombine the free oxygen. In view of the great affinity of the oxygen for metals, it should be applied only by means of glass, vulcanite, gold, or platinum, and should never be introduced into a tooth by means of steel or silver instruments. It would seem almost superfluous for me to attempt to instruct this body as to the occasions when the use of hydrogen peroxide is indicated had I not learned by recent inquiry that many dentists have never even seen it in use. When prepared with not more than one per cent. of hydrochloric acid it is non-irritant on all surfaces except the eye, and elsewhere on healthy tissues produces no apparent effect. The writer applied it in the eye of a medical friend a few days since to neutralize the poison received from a diphtheritic patient, without further injury than slight temporary pain, and with complete success, and that in a case where most known antiseptics would be inadmissible.

There is one class of cases in dental practice where its use is contraindicated, because it is *too effective*. I allude to deep-seated

abscesses to which ingress is to be obtained only through a small orifice or fistulous opening. Its application to blood or pus is instantly followed by abundant effervescence, which so distends the soft tissues as to effectually close the orifice or outlet, and the pain produced is intolerable. As an instance, a few months since the writer put a few drops into a pustule the size of a pea, near the edge of the gum, the remains of a former abscess, and in a few seconds the patient's eyes were suffused with tears. An examination showed a swelling the size of half a nutmeg, which collapsed at the thrust of a lancet. A medical friend in Somerville last winter injected one-half drachm into a deep perineal abscess following parturition, and was compelled to etherize his patient to relieve the pain and incise for an outlet. Allow me to say, however, that in each of these instances one application effected a cure; but that is not the proper method to use the remedy. For the same reason it should not be forced through the apex of a root of a tooth, unless there is a certainty of a free exit. It is invaluable for injection into the alveolar sockets after extraction of diseased roots, and the writer has not seen a single case of the long-continued soreness and inflammation following extraction which was altogether too frequent previous to its employment. Its effect in the pus-pockets so often found in pyorrhœa alveolaris has been very satisfactory. If present at the operating case, the occasions where its use will be suggested will be innumerable; but I can hardly close this somewhat discursive paper without allusion to its value as a bleaching agent. Fill the apex of a root with gutta-percha, and the canal and pulp-chamber with freshly-dried aluminum chloride, and saturate with the peroxide. Allow it to remain five or ten minutes, and wash out with sodium bicarbonate. Credit for this formula is due to Dr. A. W. Harlan, of Chicago, and I have yet to find a more satisfactory method.

THE USE OF GUTTA-PERCHA AS A ROOT-CANAL FILLING.[1]

BY FOREST G. EDDY, D.M.D.

I BRING before the society for discussion to-night my experience with gutta-percha as a filling for root-canals. I claim no originality, but rather present my gleanings from the operations of those in our profession who have made a success in the filling of root-canals and the saving of the natural teeth in a healthy condition. Some one has said, "Success in preserving devitalized teeth depends almost solely upon the individual skill of the operator, and possibly somewhat upon the materials used." To me the material used is a marked factor in relation to success.

We, who live in malarious districts, are beset in our practice with roots of teeth difficult of access, with their flattened and tortuous canals filled with pulps exposed, disintegrating and suppurating. To overcome these troublesome members, and bring them under subjection in as short a time as possible, is no slight strain upon the already overtaxed nerves of the busy dentist.

Here you have the most common methods: Root-canals with a drilled vent,—a discharging sewer. Root-canals with pulp removed and not filled,—a catch-basin for sewage. Again, canals filled with cotton, with iodoform, wood, lead, tin, oxychloride of zinc, gold, and gutta-percha. Skilled operators have made a success in the use of all these methods and materials in filling the canals of teeth.

The material that is simple in its manipulation, the method that may be acquired by the majority, should rank first.

Gutta-percha seems paramount in value. The nature of this substance and its properties have been well described to us by our associate, Dr. Meriam,—its non-elasticity; its wood-like hardness and toughness when cold; its being soft and easily moulded at high temperatures; its insolubility in water, alcohol, dilute acids, and alkalies; its ready solubility in bisulphide of carbon, essential oils, and chloroform. I think it advantageous to use it in both conditions, hard and in solution, in the filling and closing of canals: hard, in the form of small pellets and cones; soft, dissolved in chloroform, which is the method in common use. Then to this solution of gutta-percha—"chloro-percha," as we call it—I add an

[1] Read before the Academy of Dental Science, Boston, December 2, 1891.

equal bulk of oil of eucalyptus and oil of cassia,—the essential oils holding the gutta-percha in solution after the chloroform has to some extent evaporated. You all know how difficult it is to carry chloro-percha into canals from the rapid evaporation of the chloroform, leaving the gutta-percha sticking to the instrument rather than to the walls of the cavity.

A prominent, an essential factor to success is that the root be in an aseptic condition. Operators differ in obtaining this result, as they do in the use of different materials in closing the apical foramen and filling the canals.

Dr. H. Storer How says, "All methods are defective in which the operator does not know that he has closed the apical foramen."

The antiseptics of to-day are familiar, and the list is constantly increasing. The foremost writers upon antiseptics now advocate abolishing, as far as possible, all escharotics and coagulants in the treatment of septic conditions of root-canals. No antiseptic in use by the dentist answers these conditions so well as peroxide of hydrogen and the essential oils. They are non-escharotic, non-toxic,—yet antiseptic and stimulant; the manner of their use is simple and positive.

In case of immediate extirpation of the pulp by means of forcibly inserting a plug of wood,—this being preceded by an injection of cocaine, or the patient being under the influence of nitrous oxide gas,—I at once wash the cavity with hot water, to stop the hemorrhage; dry out the canal with cone of bibulous paper, in the manner described by Dr. Smith Dodge, of New York; churn out the canal with peroxide of hydrogen, instead of carbolic acid, as an antiseptic; then re-dry canal and fill with solution of gutta-percha in essential oils, which is easily worked to the apex and adheres to the walls.

Into the canal filled with the solution, carry a small piece of warm gutta-percha, gently and firmly, to the apex, following with the hard cone. The surplus solution will be forced out, and the hard cone of gutta-percha will be cemented to the walls of the canal. It will be seen that I differ here from Dr. How, if I may be permitted to again quote from his article, in which he says, "The fluid or soft plastic methods are defective, because it is only supposed, but not known, that the foramen is, in fact, tightly closed, to say nothing of the mischief likely to follow the probable forcing of the solution through the foramen."

If the pulp be in a suppurative and disintegrating condition, we remove the *débris*, using the peroxide of hydrogen from time to

time to clean the cavity as we proceed, and dress the root with fibre of cotton or silk, saturated with oil of cassia or other essential oils.

When the root is in a healthy condition, fill with gutta-percha in the manner before described.

The root having a fistulous opening, the canal is cleared of *débris*, and filled with peroxide of hydrogen. By a piece of soft unvulcanized rubber and a blunt instrument used as a piston, the peroxide is forced through the canal and out of the fistulous opening, the whole tract being left in an aseptic condition. After again drying the canal, the solution of gutta-percha is forced in similar manner through the fistulous opening, closing the canal, as before, with gutta-percha.

Frequently, after filling the canal by some of the old methods, a slight discharge would continue from the fistulous tract; but never have I had a case that would not yield to the above treatment. My theory is that the old sac at the apex of the root is distended and filled with the solution of gutta-percha, and this remains encysted. Some inflammation often results from forcing the solution of gutta-percha through the fistulous tract, but in a day or two at most it usually subsides.

In the treatment of root-canals I have used the peroxide of hydrogen for eight years faithfully, it being first brought to my attention by Dr. Crittenden, of Madison, Wisconsin. I have used gutta-percha in different and various forms for about the same length of time.

From working upon and refilling canals that have had cotton, oxychloride of zinc, wood, and metallic stoppings, I am led to think of gutta-percha as occupying the foremost position in the closing of roots of teeth that are devitalized.

I have taken the liberty, and I know you will allow it to me, to bring a few extracts from the records of work done in my office upon devitalized teeth.

From November 1, 1890, to November 1, 1891, a period of twelve months, I find the canals of one hundred and fifty-two teeth successfully filled after the manner described. To classify them a little more thoroughly, there were fifty-seven molars, fifty-seven bicuspids, eight cuspids, seventeen lateral, and thirteen central incisors. During the same length of time but two were removed as complete failures. Both of these were most faithfully operated upon, and I consider their loss and the failure due to the low vitality of the patients.

I am led to advocate this method because the antiseptics as used are not coagulants, and are not escharotic; because of their non-irritating character in relation to the soft tissues; and because of their pleasant odor in the office. No creolin, creosote, or iodoform is used in my office.

PYORRHŒA ALVEOLARIS.[1]

BY DR. EDGAR F. STEVENS, BOSTON, MASS.

Writers of twenty years ago seldom mention pyorrhœa alveolaris as occurring in patients under thirty, while at the present time we see indications of it in those under eighteen. Why this is the case is not clear to my mind. We find it in patients who live on plain food as often as in those of luxurious diet; in those who are in a good physical condition as frequently as in those of feeble health; in patients suffering from nasal catarrh no more than in those who are not.

Usually, I believe, the trouble has originated from a simple deposition of salivary calculus, which, we know, is first deposited at the margin of the gum, in close proximity to the ducts of the salivary glands. As this deposit is added to, the gum is forced away from the tooth, and the constant irritation caused by this deposit and by forcing food against the gum in mastication soon develops inflammation, nutrition is interfered with, and we have a breaking down of the connective-tissue corpuscles with formation of pus; the teeth become loose, elongated, and forced out of place, especially the tissues about the lower incisors, which become so swollen as to have the appearance of abscess; finally, a breaking down of the bony tissue of the alveolus takes place. This condition often spreads to adjacent teeth, which were, perhaps, free from deposit, and the entire set may be involved. In extreme cases we may have more or less systemic disturbance, as fever, loss of appetite, and digestive trouble, probably largely due to the amount of pus which must be taken into the stomach with food.

In treating these conditions, thoroughness in cleansing is of the greatest importance; in the first place, the deposit must be entirely removed by properly-shaped instruments. It is not well to attempt

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[1] Read before Harvard Odontological Society, October 29, 1891, by Dr. W. E. Boardman.

to complete the treatment at the first sitting, but be thorough in what is done. After the deposit is dislodged from the root, wash out the pocket with warm water, and if the alveolus is involved, use engine-burs to cut away until healthy bone is found, then rinse with hydrogen peroxide, and after being sure all *débris* is removed, protect the soft tissues with napkins, and with a Donaldson broach wound with cotton apply caustic paste to the socket as far down as can be reached. Wait two or three minutes, then rinse with warm water, and pack tannin and glycerin paste in the socket. If the pocket is very deep, lance from top to bottom; this will not give pain, as the caustic paste has obtunded the parts. If the teeth are very loose, tie with silk ligature, weaving in and out, so as to make a strong support.

In dismissing patient until next appointment (which should be in two or three days), be sure to impress upon his mind the importance of absolute cleanliness on his part; let him rinse his mouth several times a day with a wash containing half a drachm each of carbolic acid and liquid potassæ in a pint of distilled water. For a tonic, something like Wyeth triple phosphates, or cinchonidia, two-grain pills three times a day, and keep the bowels free by cathartics. At the second sitting, carefully remove whatever deposit was not dislodged at first, and inject hydrogen peroxide into the socket, after which burn out the dead or diseased tissue with the caustic paste, rinse with warm water, and pack as before with tannin and glycerin. As a rule, the brush has been used too sparingly, and we can now do a little teaching as to what we mean by thorough and faithful cleaning; this will bear its fruit at the next appointment.

The number of times a patient requires to be seen depends entirely on conditions, but, as a rule, after the gums have been satisfactorily treated and brought into a condition of comfort, it will not be necessary to see the patient oftener than once in three or four months. I do not claim to always cure this trouble, but where the socket has not been extensively destroyed, we can make the parts comparatively healthy.

There is another condition met with where the gum has receded without a deposit being found, which affects particularly the lower incisors and upper and lower cuspids. It is characterized by a retraction of the gum margin while still holding tightly to the root; there are no signs of inflammation, being simply an atrophy of the parts which probably has a constitutional or hereditary origin. Mechanical means to overcome this trouble cannot be used; we must recommend proper cleansing and systemic tonics.

In cases where the posterior teeth have been lost and the anterior teeth have been forced out of line, I would, as a rule, extract.

Sometimes we meet cases where the incisors have elongated and been pushed outward, perhaps the other teeth are in a condition to to be treated and saved, but there is no help for the incisors, for if treatment is commenced they will continue to elongate and spread, and may as well be removed at once.

LABIAL RUBBER-DAM CLAMP.

BY WILLIAM A. WOODWARD, D.D.S., NEW YORK.

THE cuts illustrate a new device for retaining the rubber dam above the cervical margins of labial cavities. It is a modification of a clamp designed by Dr. Hatch, of San Francisco, California. Fig. 1 represents the clamp adjusted on an inferior cuspid. The gum extends very low down on the lingual surface, and quite the reverse on the labial surface; a clamp with a square grip would be useless for this case. It has three points of bearing which insure even contact; screw D is one point, the other two are at the neck of the tooth from the clamp. It will take the same position as represented in Fig. 1 on a long tooth, without the assistance of screw D,

FIG. 1.

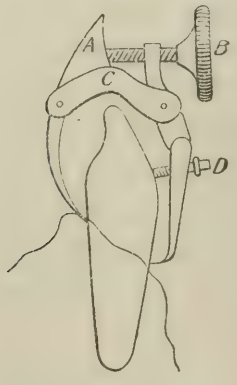
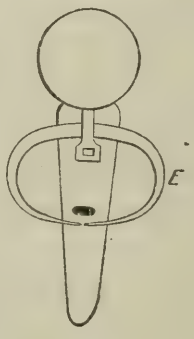


FIG. 2.



the clamp resting on the cutting edge of the tooth, and the sides of the bow E, Fig. 2, on the adjoining teeth. The screw D is used for short teeth only, as in nineteen cases out of every twenty the clamp will retain the dam without it.

It can be so regulated that there will be no infringement on the gum, and also to secure a square grip if required.

On the surface of the lever A are three counter-sunk indentations for the point of screw B to engage.

This screw-point never slips from these indentations, which give steadiness and firmness of retention to the clamp.

From the cross-bars C a hinge-like movement is secured, change the position of its grip, and allow screw-point B to enter the different indentations. Fig. 2 shows the clamp in position, and cavity high up in cementum.

It is intended for single-root teeth, for which it has worked to perfection; it has occasionally fitted even a molar.

It was exhibited at the November meeting, 1891, of the New York Odontological Society.

METHODS OF FILLING TEETH FORTY YEARS AGO.[1]

BY FREDERICK N. SEABURY, D.D.S., PROVIDENCE, R. I.

Forty years ago dentists did not have cohesive gold, did not have rubber dam, did not have the mallet in any of its forms, nor the dental engine, nor at least a score of other instruments now deemed essential to properly equip an operative dentist. And yet teeth were filled then, and filled well. I believe the percentage of success was as high then as it is now.

When I started out from the Baltimore College, in the spring of 1849, I had an outfit of instruments of better quality and larger variety than the average student of that time; but I could easily have tied the whole lot in my pocket-handkerchief.

Soft gold-foil was as well made as at present. Tin-foil was made, but the use of it was not considered respectable; and as for amalgam, in the minds of a large majority of the leading dentists to use it was almost a crime. The feeling was that any tooth that could not be filled with gold had better be extracted.

It is not contemplated in this short paper to describe the different operations or treatment in vogue for preserving teeth at the time of which I speak, but to confine the paper and the discussion that may follow to the methods and some of the instruments used in filling teeth forty years ago.

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[1] Read at the Twenty-fourth Annual Meeting of the American Academy of Dental Science, Boston, November 11, 1891.

In what I shall say I have in mind a simple cavity in the grinding surface of a molar, my object being to show the principle, and leave its application to the varying conditions as they are found in actual practice to your well-trained judgment. Contouring was only possible to a limited extent, as this system of filling required retaining walls.

In preparing a cavity, the rule was: If the depth of the cavity was equal to the diameter, the walls should be straight and parallel. In shallow and compound cavities the judgment of the operator must govern as to undercuts and retaining points.

In preparing the gold, two forms were in use. At the Baltimore College they rolled the gold into ropes, which were folded into the cavity, requiring that each loop should touch bottom, and stand out about one-fourth of its length. These loops were carried against the sides of the cavity with as much force as possible, great care being taken that no fold, after being placed in position, should be allowed to move. When no more folds could be carried to the bottom of the cavity, a wedge-shaped point was forced between them, and the gold carried each way against the walls. The hole thus made was plugged. This operation was repeated until the wedge-point could not be thrust in, when, with slightly serrated pluggers, the gold was pressed upon with all the strength the operator could exert, until it could be settled no more. Then with burnishers, hand-burs, and files the filling was cut back and finished.

The other method, and one taught me by my first preceptor, was to form the gold-foil into pellets; but the same principle governed. Each pellet was to touch bottom standing parallel, and leave sufficient gold standing out of the cavity to condense properly without being driven below its margin.

The difficulties in this kind of filling, which seems so simple in the description, are probably as great to a novice as any other. As I have said before, the gold must lie where it is first put, and on no account be moved in working in other pellets. The packing must be even all through, so that at the final condensing there shall not be hard and soft places in the filling. The amount of gold put in must be so calculated that the last piece may be carried below the surface, and condensed into the centre of the filling; for if the last piece comes out, or, from not being carried in, flakes off, you will have an imperfect filling, which will probably tumble out. But where these conditions are complied with, the filling may be condensed into a firm and practically solid mass, that will finish up well, and preserve the cavity from further decay. As a system of

illing, it commends itself, first, for saving of time; second, less nnoyance both to patient and operator; and, third, durability. I vill agree to fill the cavity I have been considering, and finish it up, while another man is adjusting the rubber dam with the clamps and veights provided to keep it in position, and with very much less iscomfort to the patient than is occasioned by all the paraphernalia made necessary to keep a cavity absolutely dry, so as to make cohesive filling possible,—absolute dryness not being essential to he perfection of a wedged or soft gold filling.

There are plenty of fillings in the mouths of elderly people that ave been doing good service for many years, that were put in, as ve used to say, submarine; for if the gold is well put in, no man an tell the difference between the wet and dry, either in finish or urability. I sent to Dr. J. Foster Flagg a lower molar, with stopping on the buccal surface near the neck, that was filled by his ather over fifty years before, in a position where I am sure he ould not have kept it dry. The filling was in place, and the tooth erfectly preserved, it having dropped out from old age.

Reports of Society Meetings.

AMERICAN DENTAL ASSOCIATION.

August 6, 1891.—Third Day.—Morning Session (Continued).

PROSTHETIC DENTISTRY, CHEMISTRY, AND METALLURGY.

Section I.

Dr. Stubblefield read a paper on the effect of hydrogen peroxide, of which the following is an abstract:

HYDROGEN PEROXIDE.

Last year, as you will remember, Professor Peirce presented a ooth which had been subjected to the action of hydrogen peroxide, vhich showed most wonderful results. In the discussion which ollowed, the writer, knowing that hydrogen peroxide was made by he action of peroxide of barium upon hydrochloric acid, guessed

that the component part which caused the irritation of the tooth had been an excess of that acid. During the winter he had made more careful examinations. He had obtained from New York, Brooklyn, and St. Louis fresh, unbroken packages, when possible, but certainly fair samples of the three best makes of hydrogen peroxide. It was an easy matter to detect in all three the presence of not only hydrochloric acid, but also sulphuric acid. Not satisfied with himself, he went to Dr. Dudley, professor of chemistry in the Vanderbilt University, and submitted to him three samples of the agent, as above. His examination revealed a large percentage of HCL, and by another test a large quantity of H_2SO_4 was found; he also found a whitish residue that was charred by heating strongly in the platinum cup. It may be thought these discoveries amount to little, but they rise in importance when considered in connection with the statement of each manufacturer that his product is absolutely pure H_2O_2. One claims, in his circular accompanying original packages, that he is the sole manufacturer of chemically pure H_2O_2, to be used medicinally, yet it can be shown from two original packages, that both HCL and H_2SO_4 were present. He claims, also, that ozone is the active agent of his H_2O_2.

It is not stated that his is not a preparation of H_2O_2. There are other things in it, and these other things change its nature necessarily. If the profession be restricted to the use of such defective products over signatures, we wonder that results are so strangely favorable.

Now, as to the phenomena observed by Professor Peirce: Any one of those three had sufficient HCL to dissolve a tooth after sufficient exposure to its action; but the calcium chloride formed by it, being extremely soluble in water, would not appear as a white mass. On the other hand, any one of those three had sufficient H_2SO_2 present to dissolve the tooth after sufficient maceration, and the calcium sulphate formed, being insoluble in water, would precipitate in a white mass at the bottom of the tube.

Further still, as the acid grew weaker, the sulphate would coat the tooth and retard, or even stop, the action, thus accounting for what he observed.

As to the other inquiry of his, the tooth was attacked by the acids present, though not so irregularly as he had expected. This was settled at the time by several good observers.

In conclusion, it is desired to present the results of some reflection and experiments on the subject by your essayist.

The distrust awakened by such flagrant departures from the

atements of the manufacturers naturally aroused in his mind
ie question whether we dentists ever had used any actually pure
ydrogen peroxide. Has any one here ever used any but the
iemical products of our best manufacturers? If not, then it is
aimed we have always used a solution of H_2O_2 with acids present.
his is about the only claim urged by this contribution, and it is
resented to this body for consideration merely. The experiments
this connection have not been as thoroughly and extensively
ursued as desired, but they may be properly presented as a report
f progress in the matter.

The H_2O_2 as obtained from the original package or fresh supply
as used in pulpless teeth, where pus was observed, and the effer-
escence was noted. On the very same occasion it was used in the
anal of a sound tooth which had been cleaned out for the purpose,
nd the same evolution of gas was again observed. The point that
as apparently made by this was that the agent would cause this
henomenon when used with pus or without it, when inside of a
ooth. This experiment was repeated several times with substan-
ally the same result.

Then the attempt was made to obtain this evolution of gas
hen the H_2O_2 was put in contact with pus outside and away from
tooth. Pus was obtained from gum-margins and pulp-chambers
nd subjected to this same specimen of H_2O_2. As far as could be
bserved, there was no evolution of gas. This was repeated, also
ith the same results.

It may be stated, parenthetically, that the tooth in the mouth is
eated to about ninety-nine degrees, which would be sufficiently
igh to cause the rapid disengagement, comparatively, of the loosely
ombined oxygen, and the difference of temperature outside the
outh might account in some respects for the tardiness of action
bserved when the tooth was in the hand; but this does not ac-
ount for the failure to obtain the same evolution of gas away from
us that may be seen when the pus is in a tooth.

The next step was to free the H_2O_2 from all acids, that is, HCL
nd H_2SO_4. When test failed to indicate their presence, it was
arefully preserved for experiment. In each case this observer
ailed to see any evolution of gas whatever in the canal, or out of
, in contact with pus, or away from it, in the mouth or in the
ooth out of it. This was repeated with the same results. His
ailure to obtain any pus at the City Hospital, from a neighboring
urgeon, was a disappointment, for he desired to compare results
rom action on pus pure and simple, with action on the mixture of

pus and saliva found in the mouth. This he reserved for a better opportunity that never came.

The last experiment was with the HCL itself, used almost full strength. It produced almost the identical phenomena as those by this H_2O_2 in the first place,—evolution of gas and all.

DISCUSSION.

Professor Peirce.—I would like to say only one word in extenuation of the subject. The tooth I placed in the solution I think at the time was a tooth largely affected by excementosis, and the surprise to me was that this abnormal growth was rapidly acted upon until it was all removed from the root of the tooth, without any perceptible action upon the crown or the enamel of the tooth. When disintegration had gone to the extent of removing the cementum of the tooth, and leaving only the dentine and enamel exposed, the action was very slow, and hardly perceptible. The tooth I presented here to the Association had only the enamel and the dentine exposed, the cementum having all been removed, and my surprise was that it had not acted upon the tooth while acting so rapidly upon the cementum.

Dr. Abbott.—I am much pleased with this paper, but still it is sad to feel that for so many years we have been using peroxide of hydrogen, and been deluded into the idea that it was a test for the presence of pus. It seems from the paper that it is not a test at all, and I have no doubt that many other substances we purchase would produce the same result in the pulp-canal of a tooth. Outside of the tooth they act the same,—no disturbance, no indication that it has any effect upon the pus. I say, while it is a very excellent matter to investigate and to learn, and particularly to observe such things, still it is to be regretted that we have been deluded so long.

Dr. Volck.—As peroxide of hydrogen is used, I think we will find it is hardly a chemical preparation. It is merely a mixture of another compound, and I have made a few experiments by allowing a bottle of it to stand open for a couple of hours, and I did not find anything in it but water. I doubt very much whether there is much value in it.

Dr. Freidrichs.—I am sorry to acknowledge that I was cognizant that the peroxide of hydrogen that I was using was not pure,—absolutely pure. It takes a very little heat to break it up, and, as mentioned by previous speakers, when injected into the tooth at 90° heat it effervesces. So when you drink a glass of soda-water you

see the carbonic acid flying off. I think we have a good use for it, however. In the first place, the combination of hydrochloric acid and sulphuric acid is in that proportion that they have a tendency to stimulate and heal. When you have an abscess where it is difficult to discharge the pus from it, what better agent could you desire? You inject it in there, and the heat disorganizes it, and consequently it forces out the pus and the fluids that are contained in the sac, the same as powder drives out the shot from a gun.

Dr. Truman.—While I am pleased with the results of Dr. Stubblefield's work, I shall continue to use it the same as I have done heretofore, for the reason stated by Dr. Freidrichs. I have found it one of the most valuable agents. I think it would be a great mistake to abandon its use. In cases of alveolar abscess that have failed to heal under other treatment, I have found that it gives us the best results; and I know of no agent as yet that can act in necrosis of the jaw with the same good effect as this one.

This agent has been before the profession for several years, and, while it has been severely judged to-day, let us remember its good work in the past, and not place it, as many do, in an atmosphere to become deteriorated, above 60°. It then becomes water. It must be kept cold. I do not fear the agents that are mixed with it, because they are all good in their places. I want it as a germicide, and I believe we have no better agent than hydrogen peroxide for that purpose.

Dr. Ingersoll.—I have long felt what has just been stated, that the possibility is that it is not a chemical compound. Of course, oxygen is retained by force. Its liberation is caused by heat, and not by chemical action upon the pus. I have tried it many times, but I have never had the confidence in peroxide of hydrogen that some have, for the reason that it lacks one element that is almost essential in all drugs, and that is a stimulating property. It should therefore be used in connection with some stimulating agent, because in almost every disease we need such a property. I have observed another thing in regard to it,—it acts badly in some mouths where there is an antral disease. If the opening is closed, and the tube is inserted to give artificial drainage, a cheese-like sediment forms by the action upon the pus, and it acts as an irritant and causes great pain. I question very much its use in the pockets of pyorrhœa alveolaris, from the fact that it is absolutely essential that it come in contact with the pus at every point. The difficulty is in compelling it to get in contact. It should be used on cotton, thoroughly saturated with it. I think we are inclined to accept

every medicine offered, and reject the old, which have been successfully used.

Dr. Horton.—I want to say a word with reference to what Dr. Ingersoll stated about the cheese-like sediment that forms. I take some warm water and chloride of sodium, and carefully syringe out the pockets where this pus is supposed to be prior to using the peroxide, and I obtain very good results.

Dr. Marshall.—Dr. Ingersoll opened a question that I have had some experience in. He spoke of the action of the peroxide. I have had the same experience with it that he has had, and have abandoned its use on that account.

I have also abandoned its use in cases of alveolar abscess. I will give one illustration. I attempted to treat a case of a lower molar, and tried to open into the pulp chamber. The gentleman who had made the operation had been so unfortunate as to pass the drill through the tooth, while attempting to open it. He put in some arsenic, and of course the arsenic went through, and we had necrosis of the septum between the roots. There had been discharges from the outside of the face. I injected the peroxide of hydrogen, and it did not seem to do much good. My patient was nearly frantic. I took a lancet and cut down both sides of the opening to give exit to the gas, but had a bad case of cellulitis that took several weeks to heal. I said that is the last time I will use peroxide of hydrogen, and it has had no place in my office since.

Dr. Stubblefield.—Dr. Ingersoll speaks of the lack of stimulating action. I am of the opinion that those acids supply sufficient. Still, his experience may not agree with mine. I have found that where there were pus-pockets, if I could get down with a little sharpened stick, carrying the acid far down, it was followed by a healthy growth and resumption of a healthy condition.

Regarding the excessive pain after the injection into the antrum, I believe it is the sulphuric acid brought in contact with water. You know in handling sulphuric acid and diluting it we have to add the acid to the water; if you do it the other way you will have an explosion. If it is too closely confined, we have that change and effervescence which is probably a coagulation, and then this elevation of temperature will be brought about.

BANDING ROOTS.

Dr. Parmly Brown.—The question of banding all kinds of crown- and bridge-work, is still an open one. I can give you a few illustrations of the condition that it is in to-day. When an eminent practitioner in this country comes to New York and brings an entire upper and lower set of natural teeth, a few days before extracted from the mouth of a lady in his city, which had been crowned and bridged at an expense of six hundred dollars, and asks us not to get too near it for fear we might observe something that may be serious,—when he said, "I extracted these teeth to save her life, after consultations with eminent physicians," it means that this is still an open question, and very wide open. Last year a lady came to my office and said she had bands driven up around her teeth until she got out of the chair and said, as Charlotte Cushman or any of our best tragedians would say, "I will be a raving maniac if you put another band on my teeth."

Another lady came to me and said, "I was sitting in the office of a large establishment, and an army officer came in, as if war had been declared. He said, 'Take out those bands from my mouth, or I'll blow out your brains.'" Now what does all this mean?

I have been an advocate of never banding if you can help it. When a band can be devised that will not touch nor injure that most delicate of all tissues in the system, the membrane around the necks of the teeth, then you can do more than you do now. In the present state of the art, there should be, if possible, never a gold band. If you have a gold band, you cannot bake it if occasion requires. It should always be a platinum band, because that will always stand the fire. It will do, in nine cases out of ten, where a gold band will not. I have put on a No. 11 band, and shall try to take it. I have one of those platinum bands, which I do not say is new.

I take a piece of platinum from thirty to thirty-six, very thin, always as thin as possible. Wrap it around and lap the edge over. I find there are no two ends of roots alike. That is why this system is good for capping roots. Put a piece of thirty to sixty pure gold between the caps; add a little flux to it and solder it. Fit it in gently. Get the length to suit. Slip it right down like this. Put your electric plugger on (if you have one that is alive), or any kind of a plugger, and work it around there. When you get the case bent over in that way you have a perfect adaptation. This case, which I will pass around, is one we made day before

yesterday, and you will notice that the band is not fastened on. In extreme cases, where there are reasons that you do not want to solder or bake, you can use this, and you have the ordinary crown fastened on with the addition of this band, which is a separate arrangement. It protects the root somewhat. You can follow these bands in an undercut. In the case of the lady whose life was saved, the sulphur end of a parlor match would break up all the gold bands in her teeth. If you have one serious undercut, that platinum will go right under there, if you use a very fine point. You cannot put it up with two such undercuts opposite each other. In most of my cases I bake the porcelain on and cover up this band so that there is room for just a little film of porcelain. I have a lady here who has one of those on. Why did I band it? Because she had a bicuspid on the other side that was split. It is proper to cut off teeth for ladies where unsightly gold fillings show, if you can do it this way, so that there is no danger of splitting the root. You are justified in excising teeth that five years ago it would have been considered a serious case of malpractice to cut off. I look around here and I see four or five eminent dentists who were spoken of as being at my office. A lady came to me and said, "I want that tooth crowned." She mentioned the names of several eminent dentists whom, she said, would not crown it for her. They would not pull out a set of teeth, as our friend did, to save a lady's life. She came to me, told me what her name was, and said, "Now, Dr. Brown, you know what handsome teeth my sister has. Well, for a long time this tooth has been a horrible nightmare to me."

Dr. Ames.—I would like to offer a method of making a very close joint between gold and porcelain in crown- and bridge-work, by means of lapping thin, pure gold upon the surface of the porcelain, making an accurate joint, as you will see. The specimens were presented by Dr. J. H. Hollingsworth, of Kansas City, Missouri.

Dr. Carroll.—I desire to be very good-natured towards my friend Dr. Brown, in discussing that crown, or his method of making it. The crown itself is all right, but the point I rise to speak upon is the cutting off of that lateral incisor to avoid an unsightly gold filling. I suppose it is to be a living lateral, and hence a very valuable tooth in its place. The root he spoke of in his remarks or the method of it, is very correct, and he spoke of a justification of cutting off a lateral for the purpose of getting rid of an unsightly tooth. I have my method here, which I propose to pass around

he same lateral which he cut off, and I think it is pertinent in reply o his remarks. The sample which I shall exhibit is that of band- ng and covering a tooth or a root, and it shows a different method. would not cut that lateral off in order to have a root to band, but would do what is here done. Here is a case of a lady of New York, who thought we had no dentists in that city sufficiently apable of doing a fine piece of work, and went to Paris, where she onsulted a very eminent practitioner, whom, I believe, we all know. Here is a sample of the case. The two front teeth were filled with old on the anterior proximal corners; she would not allow him to ontour on account of the unsightliness of the gold. The root was o be banded and a tooth inserted. The distinguished operator, for- merly an American dentist, inserted a little piece of V-shaped por- elain to supply the anterior corners of these two front teeth. You will see what the result would be, that every motion of that ateral would necessarily make a motion of the little V-shaped porcelain piece that went to make up the two corners, and hence was unsightly. The case fell into my hands because of an abscess of the root. I removed the piece of porcelain and mounted a simple device there over those two teeth. Instead of cutting it off I tele- coped over it with a porcelain front, backing it up with a little wax on the posterior part, and cast it in aluminum.

This will illustrate the amount of the cutting I did, which was ery slight, and here is the form, all completed, which may not be ew. It is original with me, and I am now doing a great deal of his reparation. I would also like to say that you will notice that he faces of this little bridge are defaced. I can explain that. I elected the shade of porcelain I wanted; it was very good. The ooth is a Weston crown. It was exactly the color, but when I put t in place she said it looked too shiny. I said I could take off the olish, but not put it back again. She told me to go ahead and take he shine off. I did so, and attempted to polish the others, and you ee the result. I then got another manufacturer's tooth, which I rowned and polished over beautifully, so that this will represent he case as put into her mouth. I then cemented it in place, and looked perfectly natural; and it is a perfect restoration without estroying the pulps of two valuable teeth.

Section II.

DENTAL EDUCATION, LITERATURE, AND NOMENCLATURE.

Report read by Dr. Ottofy, of which the following is an abstract:

Two members of the section have died during the past year.

The principal work of the section consisted in increasing interest in the local societies, that the reports of the committees may be made for the benefit of the entire profession.

A list of the dental societies and their members was prepared. It shows that there are at least one hundred and three dental societies scattered over the United States. There were represented in the society last year twenty-two, located in fifteen States and the District of Columbia; in other words, eighty-two societies and twenty-nine States were totally unrepresented.

A circular was issued by the Chairman of the Executive Committee, having for its object an awakening of the interest in local societies, and increased representation of them in this Association; also to secure a report of the different societies. It will be several years, however, before the plan will be perfectly carried out.

It is the intention of the committee to request each local society to prepare a list of its proceedings for the benefit of the Association, and to ask those societies which are not now represented by delegates to send representatives to the Association; also to publish a correct list of the dental societies and their members, now numbering about four thousand.

The Dental Association of the United States has established a course of study, which embraces a course of three years' reading of strictly dental works. On the completion of this the candidate is expected to pass the examination, and, if the reading has been thorough, he is then expected to take a practitioner's course in some dental college, upon the completion of which he is entitled to full membership in the Post-Graduate College. If he then pass a successful examination, a certificate to that effect will be issued to him.

The aim of that Association is to elevate and instruct the practitioner whose early education has not been as full as he might desire.

The subject of nomenclature has been referred to a committee of the dental meeting of 1893, to be composed of a council of den-

ists from all countries. We will not expect a report on this until he subject has been treated by a competent committee of dentists rom all over the world.

The section reports one paper from Dr. Koch, of Chicago, ntitled "State Boards, the People's Officers, and the Profession," ead by Dr. Peirce, of which the following is an abstract:

STATE BOARDS, THE PEOPLE'S OFFICERS, AND THE PROFESSION.

If we could only submit to the conditions that concern us, we vould realize in the near future the desires that seem so far away. While we are citizens of the United States, we are also citizens of he several States in which we reside. By the laws of the Union, he right to make their own by-laws and regulations for the pro- ection of their citizens has been reserved to the several States. They have also made laws that are meant for the protection of entists, although they are not alone for the benefit of the dentists. They declare that these shall be competent to practise their rofession.

It has been said that the status of the profession is established y the brightest light within it. People judge a calling by the men hey know belonging to it, and are apt to give to it such esteem as impressed upon their minds. If, therefore, we live so as to respect , and have a desire that the laity should equally respect it, we ust labor in a way that will cause them to honor and respect us. hey do not care that a dentist is licensed by a national board. They emand that all dentists who shall hereafter offer their services to em shall commence with such a degree of education that they may trust their teeth to the care of one who is fitted to act as a dentist.

The question would not be, "Has he the necessary funds to pay s tuition?" or, "Is he smart enough to make money?" No; the estion is, "Has he the necessary qualifications of mind, body, and ul to serve the people faithfully in this particular sphere?"

If this rule be adhered to it would be a good thing. A diploma ould not only be a *primâ facie*, but an absolute, evidence of the vner's capacities.

The State authorities, with two exceptions, exercise no super- sion over the purely business enterprise of the dentists. They do t appoint or examine the teachers of the colleges. They authorize em to do such teaching as they think fit. In some States the ards are compelled to issue the license to practise to those who

hold diplomas from any dental college. In other States the work of the colleges is reviewed by examiners. This is believed by the people to be the only safe way.

Much can be accomplished under the condition of the various laws as they now exist. A large majority of our colleges are private ventures, organized under some loosely-drawn law. All honor to the men and institutions whose aim has been to educate and protect the dentists. The institution in which education is ostensible only, which is conducted for revenue only, should be suppressed. In some colleges the tuition may be had for a very small sum. "The butcher, the baker, and the candlestick-maker" can be chartered as a dental college, and can issue diplomas which in some of our States have standing, and cannot be questioned. In most of our States, boards have been established with varied powers. These boards are intended for the protection of the people against imposition by dental colleges. They are the only representatives of the people. They are the only ones who are responsible for the enforcement of the law and the improvement of the dental service. It has been said that men who have never been in dental colleges themselves have been appointed on State Boards because of their skill in manipulation. This may be true. These boards are created to examine, not to teach. They are intended to enforce the laws; they require strong good sense, a knowledge of the laws, and a courage that shall give them power to report.

The manner of selection is capable of being objected to in the same way. Personally, the writer does not now recall an instance in which the appointee on the State Boards was not well and favorably known in his State as a good and conscientious practitioner Is it unreasonable to believe that men who have had the affection and friendship of their colleagues will do aught that is not in the direction of elevation? Is it not reasonable to credit men who have nothing to gain, except by a faithful discharge of duty, with more circumspection, who must more or less be guided by questions of fact, and whose interest is largely of necessity concentrated within the walls of their own institution? It is far from the writer's intention to speak of teachers who have honestly and earnestly labored to put their colleges on a high standing. They should be separated from this class of pretenders.

It should be borne in mind that dental colleges have increased to a great extent since the people have begun to think of this matter. We have now nearly as many colleges in the land as we had graduates years ago. Is it proper that the people shoul

demand a standard put on the manufacture of dental goods, too? There are people at all times who oppose law because it is law. Boards everywhere will tell you that the dental community has representatives of this class. The laws of the different States vary much on this subject, and many of them think it is impossible to do anything in the matter until it is controlled by a National Board.

A National Board is of course out of the question. There are matters of greater public concern than this which need legislation. It is common sense to accomplish the best with the opportunity you have to use the tools at your command, and to secure the best possible result with them. We should all, then, work in one direction. The future children of this family must be educated on a higher plane than their sires.

I urge upon you that you sustain both the law and its chosen executives to your utmost ability. I assure you that they occupy the position for the time being, and they can accomplish more with your aid and support than they can without it. If the position that has frequently been taken, that members of the board are many times themselves unfit to act as examiners, be true, I wish to say, lend them your aid, to construct better material for future years! I am quite sure that many of you have never had your thoughts directed to the fact that you discharge the obligations of your practice simply by the license of the people. The people, in the early history of the country did not see fit to assert their rights. The people have a right to demand that the physicians, the dentists, the lawyers, the teachers they employ, shall have the necessary qualifications to discharge their duty, and in many States this right is asserted.

If the people should not recognize any diploma whatsoever in dentistry, and subject every member to an examination, they would follow out the practice that is followed in some countries. Indifferent institutions and indifferent teachers would no longer be of any use. The degree of the Faculty ought to have more potency than the degree of the Board. The public is not satisfied with the evidence of a diploma, but requires a further examination by the Board, outside of the Faculty.

Nearly all our schools are private enterprises. The diploma and the tuition are both given for a consideration, and it is not unreasonable if the people, having the right so to do, through their officers, verify the qualifications of the dentists as certified on their diplomas.

The writer desires to express the wish that dentists generally would take a greater interest in the duties and trials that come to members of State Boards in the discharge of their duties; they would aid their colleagues who for the time being are in office.

If we would all do this, our profession would be much more respected, and the people would be better served, and when we finally lay down the forceps, the plugger, and the mallet, we would feel satisfied that we have used our instruments in the cause of general good.

(To be continued.)

AMERICAN ACADEMY OF DENTAL SCIENCE.

The regular monthly meeting of the American Academy of Dental Science was held at the Boston Medical Library Association rooms on Wednesday, December 2, 1891, President Brackett in the chair.

A paper by Forest G. Eddy, D.M.D., subject, "The Use of Gutta-Percha as a Root-Canal Filling," was read.

(For Dr. Eddy's paper, see p. 195.)

DISCUSSION.

Dr. Briggs.—I am very glad to hear this encomium upon the use of gutta-percha as a root-filling. Ever since hearing a paper read some years ago by the late Dr. Whitten, on immediate root-filling, I have followed the plan which he then laid down. I believe he afterwards changed the filling material from gutta-percha to oxychloride of zinc, on account of the antiseptic properties of the latter substance. My experience, however, in treating severe cases with gutta-percha was so satisfactory that I thought it unnecessary to make a change.

I have nothing to add to the paper, and endorse it fully in all its details.

I want to speak more particularly of filling roots having fistulæ. In such cases it has been my custom to pump liquid gutta-percha through the root-canal, and follow it with solid gutta-percha until a line of liquid gutta-percha appeared at the fistulous opening. Where this plan has been followed cases have been particularly successful. I had a gentleman in my chair to-day for whom I

accomplished this result. About nine years ago he came to me for the treatment of the right inferior first and second molars, both teeth having fistulæ opposite their roots.

These fistulæ had been discharging for years. The roots had been filled according to another method by a very careful operator, but the teeth were loose as a result of their fistulæ. I drilled through the roots with a large drill, got a free opening, and filled them, so that the gutta-percha came out through the fistulæ as I have described. Of course the teeth were a little sore; but the gum healed and the teeth tightened up, and to-day the gum is perfectly normal, except that it is full of cicatrices.

That case was a type of a number of cases, which led me to feel that you must fill thoroughly,—not only the root itself, but often through the root,—with a substance compatible with the tissues, like gutta-percha. The tissues encyst it as they would a leaden bullet.

You may say that oxychloride of zinc would have the additional advantage of being an antiseptic; but the point is, to make the root aseptic before you begin to fill.

Dr. Banfield.—I would like to ask Dr. Eddy or Dr. Briggs whether, in an anæmic person, after gutta-percha is forced through the fistula, they would expect the tissues to heal as quickly as in a more healthy person?

Dr. Eddy.—Not so quickly. There is enough free acid in the peroxide of hydrogen to break up the old tract; what is not encysted is thrown out in two or three days.

Dr. Brackett.—Does Dr. Eddy insert the solution of gutta-percha immediately after cleansing the root?

Dr. Eddy.—I do where a fistula exists.

Dr. Grant.—I would like to ask Dr. Eddy if he can say whether there is an antiseptic property in chloroform?

Dr. Eddy.—I cannot say. I use chloroform to dissolve the gutta-percha, and the mass of chloro-percha is mixed with an equal proportion of an essential oil, such as eucalyptus. The substance then becomes of such a nature as to readily stick to the walls of the cavity.

Dr. Grant.—My idea is that chloroform is an antiseptic. I have sometimes thought that the chloroform had as much to do with the success of this treatment as the previous antiseptic applications.

Dr. Eddy.—There is hardly any chloroform in the solution that I use. It is evaporated. My method is to dissolve gutta-percha to

the consistency of thick cream, dip an old Donaldson's broach into the solution, and fill not only the canal but the whole pulp-chamber. Then with a piece of unvulcanized rubber and a blunt instrument, used as a piston, force the solution of gutta-percha through the canal and fistulous opening. If there is no fistulous opening, then smear the walls of the canal with the solution, and at once carry a hard cone of gutta-percha to position.

Dr. Clapp.—Without causing considerable pain, I have had the greatest difficulty in getting creamy substances into such fine roots as have not a fistulous opening. Air prevents the solution from going in, and I feel that the chances of forcing gutta-percha to the end of the root are very slight. The only way I can satisfactorily accomplish this result is by first filling the root with some essential oil, either eucalyptus or some other, and following that with the solution of gutta-percha. Capillary attraction will assist in carrying it in. If I attempt to put chloro-percha into the root without first using an essential oil, I feel that I fail almost every time.

Dr. Briggs.—The gutta-percha which I use is pure, not that which we use for stopping, which may be gutta-percha and oxide of zinc and some other substance, but simply the pure gum dissolved in chloroform, with the essential oil added.

Dr. Eddy.—I use the same thing; it is about seal-brown in color.

President Brackett.—Where is this pure gutta-percha obtained?

Dr. Eddy.—In any rubber-store.

Dr. Banfield.—Will Dr. Eddy please state just the proportions in the mixture?

Dr. Eddy.—There are no special proportions.

Dr. Eames.—I am in accord with what has been said in regard to the efficiency of gutta-percha for filling canals, and would say that I am very much indebted to Dr. Clapp for showing me how to fill canals in a way similar to that described.

I have very frequently noticed the fact that pain has been occasioned by forcing the filling material into a canal, and I attributed it, as Dr. Clapp has, to the pressure of air within the canal. When such has been the case, I take a much finer instrument and fill less rapidly.

To give compactness to the filling, I have been in the habit for three or four years of forcing gold and platinum wire, and more recently copper wire, into the gutta-percha mass, and leaving it there.

Dr. Eddy.—I have a patient who has a tooth, the root of which

was filled with cedar-wood by Dr. Seabury twenty years ago, and it is in just as good condition to-day as it was when filled.

Dr. Seabury.—I have used cedar-wood for more than thirty-five years, and I think my success is, perhaps, as uniform as anybody's. It is peculiarly fitted for filling root-canals, as it is very soft laterally and adapts itself readily to any irregularity in the canal, and is very firm when dried. I must say I am a little surprised at the success of driving gutta-percha up through a tooth. I should expect that it would make trouble. I never dared to fill a tooth with gold when I knew it was open at the apex.

ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.

At the regular monthly meeting, held January 11, 1892, the President, Dr. Jack, introduced the essayist of the evening, Dr. G. W. Weld, of New York City, who read a paper entitled "The Syrup of Iron Chloride."

(For Dr. Weld's paper, see page 161.)

This was followed by a discussion, which was opened by Professor A. H. Elliott, of New York, who said: I first became interested in this subject from some experiments of my friend, Dr. Weld, five or six years ago, when he brought to my notice the astonishing fact that he could neutralize the acid of the salt of iron without precipitating it. At first I was inclined to laugh at him. After he had demonstrated to me that it was so I went to his office and saw some experiments he was making with Vichy water, and he was adding this in very liberal quantities to tincture of muriate of iron without precipitating it. It certainly was a fact, but it was rather contrary to my preconceived notions of chemical reactions. Nevertheless he interested me in the action of tincture of iron and acids upon the teeth, and I made an analysis of the enamel and arrived at its chemical structure, and I also undertook experiments with regard to the action of acids on the teeth, and this led me to think of the possible union that could take place between Vichy water and the iron salt which he had certainly neutralized.

All the authorities upon the preparation of the tincture of chloride of iron are agreed that you could not have a tincture of chloride of iron minus the free acid without precipitating it.

It has been concluded that free acid in conjunction with alcohol formed ethyl chloride which forms in tincture of chloride of

iron and thus eliminates the acid, but that is evidently not so. Dr. Weld's experiments with the teeth and also in connection with carbonate of lime and other substances have proved beyond a question that acid is still present in tincture muriate of iron.

In the action of acid upon the teeth, certain modifying circumstances can take place. Suppose we get rid of all the hydrochloric acid, and that we have nothing but the pure perchloride of iron left with the minimum amount of acid. If you place any substance in it that is capable of reacting with it, as carbonate of lime, which is part of the enamel of the teeth, you could readily get chloride of calcium from the carbonate of lime and you would get basic carbonate of iron. So if we could get tincture muriate of iron without acid that would not precipitate, we should be all right; that is, get it free from acid and not precipitate basic salts of iron; we must get the fluid into the condition that it will not allow the salts of iron to diffuse. That is, it should make them adhere to the teeth and thus protect them, or if this will not do we must introduce something else to prevent it. The doctor has not only succeeded in eliminating the acid, but he has succeeded in eliminating the action of the chloride of iron itself, or rather prevented the action of chloride of iron upon the enamel of the teeth by having there a dense syrup in which the iron compounds are partially soluble.

While he was speaking I made one or two notes: "The reason that the tooth is not acted upon by the concentrated tincture of muriate of iron, he showed, was due to the fact that alcohol present in it prevents diffusion of the iron salts into the fluid." With regard to acid saliva, I am not a physiological chemist, but I think of these things in connection with chemical facts, and it appears to me that in every case where the saliva is said to have been acid, it is under circumstances where no precaution has been taken to get rid of the food adhering to the mouth, and it is not improbable that after it has passed the mouth, the residue has become the victim of bacteria. Fermentation has been set up by the substances that have been left in the food adhering to the mouth, and that is probably the cause in many cases of the apparently acid reaction of the saliva.

There was a case cited where a number of cows had been fed on distillery slops. That is acid. We have had a great many cases of that kind in New York. The slops were often acid, and of course, if a cow has been living on that food, why should not the interior of the mouth be of the same character, unless it be thoroughly washed out?

Dr. Dwinelle, New York.—Probably this question influences or affects no profession more than it does ours. It is well known, or used to be with me, that the mere tincture of iron was one of the most important tonics we had to deal with, and in a short time it has been eliminated from that as the great objection,—its action upon the teeth,—and we are trying to resort to mechanical and other means, such as tubes, quills, etc., to avoid the hydrochloric acid coming in contact with the teeth. So much has been this objection that in many cases they do not use it at all; it has been almost abandoned by the profession, but since this preparation has come to the front we are encouraged to believe we can resort to it and secure the advantages we have derived from it heretofore. I trust that will be the case.

Some singular chemical facts have come to our knowledge through Dr. Weld's paper,—almost an anomaly, almost a contradiction; in fact, it is somewhat like the homœopathic theory,—the weaker a thing is the stronger it is.

We have seen by experiments that when the teeth have been in conjunction with pure hydrochloric acid the action is slow, but reduce it by eight times its volume of water and it at once becomes potent, powerful, and effectual. Dr. Weld must be the first one who made that discovery. The elimination of the free acid, or causes of acid, removes one of the objections so far as the teeth are concerned; furthermore, the removal of the acid renders it more acceptable to the stomach and the mucus membranes at large; in eliminating it in this way it is more readily tolerated, and becomes an agreeable medicine to take.

This subject that Dr. Weld has given us is a text we can preach upon at our leisure, and can make very profitable for thought. There is no profession that it interests more than our own. It is a most interesting subject, and we will all profit by it.

Dr. Mills, New York.—The paper has interested me very much and I think I cannot do better than to bring to the notice of the meeting something that has attracted my attention in several journals; among the rest was the *Commercial Advertiser*, and also an article in the *North American Review*, in which is given the past and future of medicine, and the writer arraigns medicine for the slow progress made. Among the other criticisms are some things I think might be profitably brought to our attention in the dental profession. He says that among the things that have stood in the way of progress and scientific action among medical men is the want of mental culture, and a lack of scientific ambition to investi-

gate special subjects. He speaks of the few remedies that have any peculiar bearing upon the practice in special diseases. It seems to me that this paper has impressed itself on my mind in this direction. Dr. Weld has exhibited here his ability to prove that he has some scientific ambition. We ought to congratulate ourselves that we have one among us who can bring such a paper as this to our attention. He has brought forth a specific remedy, and by taking away the hydrochloric acid he is able to take away the deleterious effect of the action upon the enamel.

Dr. Jas. Truman.—I was extremely interested in the doctor's former paper read before the Odontological Society of New York, and was especially gratified that he had taken up this subject and had carried it forward to the extent he had at that time. He has shown us to-night the possibility of using chloride of iron without injury. It is a subject that has claimed more interest in the dental profession than it has, unfortunately, in the medical. Every individual in practice has known of the disastrous results that have followed the use of chloride of iron, many cases occurring where our best efforts have been neutralized by its use. In my own experience I might recite many very serious cases where whole sets of teeth have had portions of the anterior surfaces destroyed by a treatment of chloride of iron. It has become, therefore, a matter of vital importance to us as dentists to try to eliminate this agent from the medical profession, or, to do as Dr. Weld has, give them something they can use without injury.

There is really nothing in this paper to antagonize, and therefore it is not readily discussed without taking up the entire subject; but there is one point I would like Dr. Weld in his response to reply to, and that is, that if this agent or preparation that he has made passes into the stomach and there undergoes a change back to hydrochloric acid, as I understand him to say, whether there was not a danger of possible regurgitation and secondary acid action on the teeth?

I was struck with the remark of Professor Elliot, that the saliva of animals will become acid by the use of certain still-slops. I remember a number of years ago, in the western part of New York State, where I was then residing, that I was brought in contact more or less with the animals that were kept at the distillery. Large droves of hogs were fed on the still-slops to the destruction of their teeth, and in a very few weeks these were entirely eroded, and that to such an extent as to be almost useless. I have noticed the same effect from still-slops in other directions. I do not believe,

with Dr. Elliot, that the saliva of animals is ever acid, or at least if it is acid it must be on exceptional occasions. I go further than that, and am prepared to assert that human saliva is very rarely acid. I have not found it so in my tests of the secretions of the mouth, nor is it alkaline, but gives a neutral response. It was on that basis I was led to entertain the hypothesis that the oral secretions during the active period of the twenty-four hours, or during the day-time, could not possibly act upon the teeth. I therefore determined to extend the testing to the period of absolute rest, or during the night, and it was my experience in repeated observations that the saliva during these hours gave an acid reaction.

Now, I agree fully with Professor Elliot in regard to the possibility of foods fermenting by being left in the mouth. If any one will test the mouth in those quiet places, such as cavities that are outside the active rush of the salivary fluids, they will find they get an acid reaction. I hope this preparation of Dr. Weld's will be adopted, but there seems to be in the medical profession a general antagonism to the opinion of dentists in regard to these matters.

Dr. Faught.—The subject is one in which I have been long interested from a personal relationship. While I wish to state the result of my observations here to-night, I do not cite these cases as being antagonistic at all, but it has been to me a matter of deep interest. I have had a great deal to do with the use of the ordinary tincture of iron in the case of my children. I do not find in their mouths, from its use through a period of years, any more, nor indeed as much, dental caries occurring as it has been my custom to observe in the mouths of other children. I state this because we have not taken precautions, for reasons of my own, as to the use of tubes or quills.

I have been in the habit for some time of taking medical care of my children to a certain degree. For a long period the older child has been subject to recurrent attacks of tonsillitis, which would occur through the winter-time. I painted the tonsils with tincture of iron in dilution of about half water, using it quite frequently, as often as the urgency of the case required. I have used it at all hours of the day and night, and have made free use of the iron internally, giving it in large doses up to the limit, and so with the youngest child for other conditions, but in no instance have I found the condition of the mouths show any evidence of undue breaking down or disintegration of the teeth. And I have not taken preventive measures. There may be reasons which overcome acid reactions, and perhaps the tincture of iron is very carefully pre-

pared; I will say that it is not the tincture of iron ordinarily obtained from drug-stores, and it may not be quite so acid. I merely state these facts because it has been to me a matter of considerable interest and wonder, extending, as it has, through a period of years.

Dr. Weld, in answering Dr. Faught, remarked: Of course, when the modified tincture, so to speak, passes through the mouth into the stomach, it combines with more acid and is likely restored to its former condition. The hydrochloric acid which it meets in the stomach is very small in quanity, and it could not be very much changed. My idea in speaking of that was merely to illustrate that after it passed the mouth and into the stomach its acidity would be increased rather than decreased, and that on account of that increase it would, perhaps, be more likely to be diffused through the system than otherwise. In other words, if we assume it was taken in the stomach, and instead of the acid increasing it should decrease, we would probably get precipitation. We would have an emasculated preparation of iron which would not be diffused. We know there are various preparations of iron which have been put upon the market, and a number of other preparations which are not easily changed when they reach the stomach.

One thing in connection with the chloride of iron is, that when it enters the stomach it is more diffusible than other preparations. As stated in my paper, physicians and practitioners have observed that it had a quicker and better effect than most all other forms of iron. Unfortunately, as you all know, we can get very few children, with, perhaps, the exception of my friend's children, to take that form of iron. It makes but little difference whether it is the children of the wealthy or of the slums or dispensaries. The poor woman says to the physician, "My child will not take that iron," and the wealthy woman's child objects in the same way, and if they take it, it is with a great degree of reluctance. Dr. Winters, a friend of mine in New York, is trying it in cases of diphtheria. He states that after it has been used a certain length of time it excites nausea and vomiting.

I wish to emphasize here a matter which I mentioned before the Odontological Society of New York; that is, that I believe the margin of the gums, as a rule, retains acid longer than any of the other surfaces of the mucous membranes of the mouth, forming a sort of sack that holds it, and that not infrequently if a piece of delicate litmus paper is put to the margin, you get the color indicating an acid present. If the mouth be thoroughly rinsed, there is

no acid. If a little acid be taken in the mouth again, and the mouth be rinsed and the litmus paper applied, you get no acid; but at the neck of the tooth you have that reaction. I am not prepared to say at present whether the retention of acid at the margin of the gums can affect the teeth in any way. I have not studied it, but I think there is something in it worth Dr. Kirk's consideration. I am very sorry that that gentleman is not here, and especially so to know that sickness prevents him.

I do not know that I can add anything to what has been said. There are people who go through the world with iron constitutions, and are not affected by alcohol or anything else; and there are some children whose teeth are exempt from acid, and I am glad to know that that is the case with my friend's children. There are chemical laws governing the action of acids on carbonate of lime wherever it is, and the law is unchangeable. It will attack it at once, and all the washing you can do afterwards does not remove the first contact.

Professor Elliot.—I once made experiments with some enamel prepared for me from a large number of teeth,—twenty-nine, I think, the doctor said,—from different patients, and I found that a mere immersion in a weak six-per-cent. solution of acetic acid—simply dipping the enamel in and removing it—reduced the weight of the teeth eight per cent.

Dr. Dwinelle.—I believe the fact of the deleterious effect of hydrochloric iron upon the teeth has been known and recognized almost as long as medicine has been practised. I believe there is no doubt about it, although there may be exceptions to the rule; but the fact itself remains the same and impregnable.

Dr. Truman said he could not help admiring the courage of Dr. Faught in giving his children chloride of iron in the way he did, though the courage was not to be commended. If a microscope be used, it will be seen how little acid, it takes to dissect out the enamel,—one part in ten of water. The action of hydrochloric acid is readily seen in sections, cutting it away. It is the practice we have always adopted in dissecting out this tissue. Now, if so small an amount will do it, how could Dr. Faught use chloride of iron on his children's teeth *ad libitum*, without producing more or less injury to the teeth?

Dr. Faught explained that he had merely mentioned the case because it was of especial interest to him, and stated that any one who cared to see the children might do so.

Dr. Weld asked if it had been applied locally or systemically,

to which Dr. Faught answered that it had been used in both ways. Dr. Faught stated, in answer to Dr. Truman's surprise that an intelligent dentist should use acid so freely, that he had the personal and careful and constant inspection of the teeth, and should have desisted at once upon the appearance of injurious effects.

Professor Elliot asked if he knew the origin of the tincture of iron used, stating that in the College of Pharmacy in New York he would frequently have people come to him and ask if preparations they submitted were up to the standard, and that if Dr. Faught would examine the tincture of iron he had used he would be surprised at the strength. Tincture of iron should contain $7\frac{8}{10}$ per cent. perchloride of iron. Some tincture of iron is very mild as compared with others. Some almost fume from the excessive quantity of acid. Our friend may have gotten hold of some of the mild variety, and it might have been made by some conscientious druggist who prepared his own preparations, and who took care to reduce the iron.

Dr. Faught stated in reply that the iron he had used was procured in every instance from a personal friend,—one of the heads of a department in John Wyeth & Co.'s,—who prepared it for him expressly.

CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY.

Regular meeting held Monday evening, April 20, 1891, at Newark, N. J. The President, C. W. F. Holbrook, in the chair.

Richardson Grey, M.D., of East Orange, read a paper entitled "We Specialists."

(For Dr. Grey's paper, see page 177.)

The President.—Gentlemen, the paper is before you for discussion. Dr. Bogue, may we hear from you?

Dr. Bogue.—I should like to make my thanks to the essayist He has brought forward a point or two that seems to me unusua in precedent.

We are as a profession crushed; the State has taken hold of u and excluded me from practice in it. While not complaining o that, either, I was not a little surprised to find that the doctor ha noticed the exclusion of the word State. It has come to me, also that this is a specialty of a specialty. Gas is not the only specialty we practise.

Dr. Grey, in referring to our exclusion from the medical profession, has not taken into account an item of history, that forty-five or fifty years ago we, I mean the dentists, asked for a chair in a medical college, in order that students might study medicine; might get a ground-work of anatomy, physiology, pathology, etc., etc. We were refused, and it was only after the Baltimore College was organized that we were granted this privilege. From that time we have extended our knowledge and we have been known as specialists within and without general medicine. But very much as our country began with a protective tariff, and is coming gradually to free trade, so we dentists began as tooth-pullers, and have worked our way up until we were received at Washington at the last Medical Congress, and our profession as a specialty of medicine recognized, and we were given a stimulus that we have felt ever since.

Another stimulus was offered a few years ago by which only graduates of two of our American colleges were recognized in England. A great hue and cry was made both here and there, and the result was that our standard of dental education was raised, and from that date onward we must answer for three years in our dental schools; a very creditable condition of things, largely due, it seems to me, to that law which for a time appeared to us most oppressive. I venture to speak on these matters, as they have been extensively touched. I want to give the doctor a few words of encouragement in the fact that we are striving towards the point which he has so equivocally given us.

Dr. Domingo M. Salater.—Many diseases of the throat and ear are connected with the practice of dentistry. I saw a case of pharyngitis from the improper development of the wisdom teeth, and the patient was in the hands of an M.D. for fourteen years. Finally he went to a dentist, and when those teeth were brought out nicely and everything was clear, his condition was better, and he was cured within three weeks.

I will hope that a future time may come when the relations between the M.D. and the D.D.S. will be more intimate, and I think that we will then accomplish a great deal more for each other.

Dr. Meeker.—In reference to the advertisement of "fresh gas daily," I want to say that every dentist here knows that fresh gas is not good gas, that the anæsthetic properties of gas that has been purified are much better for the public use than gas that is fresh.

Dr. Mills.—Mr. President, I do not know that I can say a great

deal on this subject. I agree with Dr. Bogue, and want to make my thanks to the essayist.

I regard the reading of medical papers before us as very timely. I certainly think we have a great deal to learn from the medical profession, and I think, too, that medical men have much to learn from us, dentists.

We should be sympathetic workers for progress, and we certainly should accept suggestions from our medical friends graciously.

Dr. Stockton.—I want to say that the essayist has brought out some points that are well worthy of our consideration. While we are not educated medically, yet I want to take the ground that we are medically valuable; the teeth holding a high place in the human organism, quite as important as any other organs, and as a necessary sequence we should be as educated as are medical men. I say to-day, as I have often said before, that the man who expects to be a successful practitioner of dentistry should know the whole system from the top of the head to the sole of the foot. You cannot stop just at the teeth; dentistry is not a mere matter of being able to extract a tooth or put in a plug.

I want to emphasize this point, that according to the provisions of the State law a man who is not qualified cannot come into practice. Dr. Bogue very well said that we are now to-day recognized as part of the medical profession.

Dr. Bogue.—Mr. President and gentlemen, may I be allowed a moment? I want to announce what may, perhaps, seem a heresy, after Dr. Stockton's remarks and those of the gentleman *en face.* I know so little about gas that some of the points brought up this evening are new to me. I want to proclaim that I do not know enough to extract a tooth that is not pulled out by a string, except in a few cases where the deformity is so great that no other course could be taken. It seems to me that we might possibly be justified in saying to the student, "Whenever you extract a tooth under such a circumstance, necessarily the extraction of a tooth is the acknowledgment of incompetency." Possibly our knowledge reaches its limit in such cases. There are conditions beyond which we know nothing, and so we give it up.

Dr. Osmun.—The discussion has taken quite a wide range. To the last remark of Dr. Bogue I would take exception. He says that the extraction of a tooth is the admission of incompetency. I cannot believe that, and there are times when extraction is admirable surgery, and must be resorted to. I have seen some cases in my

hort practice when it was good surgery, and was not an acknowledg-
nent of incompetency.

The administration of anæsthetics in dentistry is like the ad-
ninistration of anæsthetics anywhere else. With careful super-
vision it is right, proper, and to be commended. The first object of
dentist is to relieve pain, and the right use of anæsthesia is an
mportant adjunct in this connection.

The question of the education of the public is a very commend-
ble one. The educated patient is always the appreciative patient,
nd every professional man ought to be a teacher. It is his right,
is privilege, and his duty to educate every patient who comes into
is chair.

EPORT OF SPECIAL COMMITTEE OF FIVE RELATIVE, TO RESOLUTIONS ON THE DEATH OF DR. ATKINSON, M.D., D.D.S.

Dr. Luckey.—Mr. President and gentlemen, you will, of course, ecollect that when the news of Dr. Atkinson's death reached us it vas agreed that certain resolutions should be passed, and a com-
nittee of five were appointed for that purpose, consisting of Drs.)smun, Stockton, Meeker, Watkins, and Holbrook, and it was sug-
ested that we draft a series of resolutions for your endorsement.

Resolved, That a Memorial Committee be established or instituted, composed f two members each from the First District Dental Society of New York, the dontological Society of New York, Second District Society of Brooklyn, Cen-
al Dental Association of Northern New Jersey, and the New Jersey State ental Society, making a committee of ten, who shall be empowered to organize iemselves, and call upon the whole world for a generous response, to the end iat a suitable memorial be erected to the memory of our lamented friend Dr. Vm. H. Atkinson.

B. F. Luckey.

Remarks were made on the life and character of Dr. Atkinson v Drs. Stockton, Luckey, Watkins, and Levy, after which the psolution was passed.

Adjourned.

Editorial.

A NOVELTY IN TREATMENT.

From the period when Maynard and his co-laborers endeavored to impress the active minds of the profession with the importance of properly preparing and filling pulp-canals, has this apparently simple subject remained in an unsettled state, and is still one of continual controversy in professional gatherings. For more than thirty years after the use of gold was recommended, the number was comparatively few who were willing to antagonize the practice of packing this metal solidly in canals. Gradually other and less complex methods were introduced, at first timidly, but, as time advanced, with boldness and a spirit of aggressiveness, indicating that the use of gold in pulp-canals was gradually passing into disuse. The introduction of oxychloride of zinc, with a better knowledge of how to handle gutta-percha, completed the destruction of old ideas in this direction, and the royal metal, for this purpose, was relegated to oblivion.

Then came a period of mixed treatment. The operation ceased to be confined to one material, and we were presented with cotton,—cotton saturated with carbolic acid or cosmoline; cotton with oxychloride, or the latter material pumped into the canal without any vehicle to carry it; wood from the pine or cedar; metal wires saturated with chloro-percha or without; aristol and antiseptics; the operator who believed in coagulation and the one who denied its possibilities,—indeed, the list has become extended so as to include all the whims and notions that naturally arise in a daily active practice.

It is not surprising that, with this discordant condition of affairs, the subject has come to be regarded at our annual conventions as one scarcely to be tolerated.

Recognizing this, we would not occupy space with its discussion if we did not feel that the last word on this very important topic has not yet been written.

From what has been gathered from the somewhat incongruous *mélange* of practice, it must be evident either that the filling of the

pulp-canals is not the important matter it has been supposed to be, or that there is a wide-spread lack of that scientific pathological knowledge so absolutely essential in all treatment.

It is presumed all intelligent operators in dentistry will agree that, with our present knowledge of the germ theory, the important thing to do is to first render the canal aseptic. The second must be to remove all the evidences of putrefaction, and the last to fill it so that it shall absolutely be impervious to fluids both from within and without. This much conceded, that filling is the best that will accomplish this, and that filling is the worst possible which permits absorption of fluids, whether this be imperfectly-packed gold or porous wood.

We have been led to these reflections not from any apparent necessity for an article on this subject, but from the evidence recently presented that from the use of gutta-percha we have been invited to consider the possibility, nay, more, the absolute necessity, of filling all the parts adjacent to the apical foramen, carrying the operation through to the external opening of the fistula produced by alveolar abscess.

This entirely new departure is presented in a paper in this number, prepared by Dr. Eddy and read at a recent meeting of the Academy of Dental Science, Boston. It may not seem strange in these days of startling therapeusis that such a mode of treatment should be suggested, but it does appear remarkable that in this body, composed of the ablest thinkers in the profession in New England, that only one should rise and doubt its propriety. The quotation will explain the position of the essayist.

After using peroxide of hydrogen, and the "whole tract being left in an aseptic condition, . . . gutta-percha is forced . . . through the fistulous opening, closing the canal, as before, with gutta-percha. . . . The old sac at the apex of the root is distended and filled with the solution of gutta-percha, and this remains encysted. Some inflammation often results from forcing the solution of gutta-percha through the fistulous tract, but in a day or two, at most, it usually subsides."

We are not disposed to dogmatically assume that a process antagonistic to received ideas may not have within it the germs of something good; indeed, in these days of heroic surgery such presumption might lead to serious after-reflections on the limitations of human perception. It is, therefore, with no spirit of direct antagonism that we feel impelled to call attention to this remarkable latter-day treatment of pericemental inflammation and the result-

ing fistula, but rather to broaden, if practicable, thoughts upon this subject.

Perhaps it is not possible to intelligently consider this matter at all unless an outline be made of the condition of a tooth after the destructive effects of alveolar abscess. The focus of inflammation may be supposed to be at the apex of the root. This means primarily congestion of the blood-vessels of the pericementum, the infiltration of the fibrous tissue with the corpuscles and fluid contents of the blood, and final thickening of the membrane and its subsequent separation from the cement and the formation of the, so-called, sac. This is effected by the pressure of the fluid elements between the wall of the sac and the tooth. This means that the cement, and consequently the tooth, to the extent of separation, has lost its means of nutrition. The final result is necrosis of that portion. After an indefinite period a fistula is established and the confined pus escapes. These pathological truisms need only to be stated to intelligent readers. If, then, this condition exists in all cases of abscess we are forced to the conclusion that no tooth having been once placed in this abnormal pathological state can ever again regain, while the dead portion remains, a condition of absolute health.

Having arrived at this point the essayist proposes to fill the canal with a solution of gutta-percha and chloroform, and pump sufficient through the foramen to distend the sac and fill the fistula, and then the whole is left to become "encysted."

It is a recognized fact that nature tolerates with wonderful kindness foreign bodies, but we have yet to learn that a tissue in a pathological state will accept the intrusion of a foreign element and be restored through its influence to a state of health and a reparation of parts. Yet this is exactly what must be done to make the plan proposed a success.

In considering this subject, the safe course may be adopted of endeavoring to arrive at correct conclusions through facts presented in clinical experience.

Dentists have been taught that the forcing of foreign matter through the apical foramen means, sooner or later, an increase of the local inflammation and its possible extension to surrounding parts. They have recognized the truth of this whenever they have been unfortunate in forcing any substance through this natural opening or one artificially made. There has been no exception to this. Gutta-percha has been equally as bad as cotton, and portions of gold equally as injurious as a wire penetrating the foramen. It

may be argued with some force that this is not analogous to a mass injected until all parts are thoroughly filled, but to our conception the greater includes the less, and means, if it means anything, only an increase of the irritation and subsequent destruction of parts.

The experience of the writer is, probably, in accord with the majority, that the presence of a foreign body at that part of the human organism simply invites an increase of inflammation.

Whether it has been from an extension in the use of agents, in a semi-fluid state, in canals, or through carelessness in pressing material beyond the prescribed limits, it is certainly true that the number of cases of necrosis of the alveolus is on the increase. This may have its origin in the necrotic condition of the cement surrounding the root at the apex, but in several recent cases it has been traced directly to the constant presence of gutta-percha. In one case of serious character involving extensive destruction of adjacent tissues, this was so clearly apparent that we have been forced to the conclusion that he who attempts the operation proposed by the essayist must be pronounced guilty of experimenting on his patients without proper warrant.

The essayist fails to give any philosophical reasons for the faith he maintains, nor do those who so fully endorse the practice. That they have had apparent success must be conceded, but that does not mean that the process is theoretically correct, or that it has been scientifically demonstrated.

As the matter stands we cannot encourage any radical departure from established methods, but would rather advise the most conservative handling of the pulp-canals, if the operator wishes to avoid mortification and loss in attempting those things not in accord with recognized pathological experience and treatment.

ANNUAL MEETING OF THE INTERNATIONAL DENTAL PUBLICATION COMPANY.

The Tenth Annual Meeting of this Company was held at Jersey City, January 23, at which a large majority of the stock was represented.

The usual routine business was transacted of reading the reports, auditing accounts, and the election of officers, of which the old list was retained with the exception of Dr. Jacob L. Williams, of Boston, who declined re-election. His place was filled by the election of Dr. Horatio C. Meriam, of Salem, Mass.

The meeting was marked by an earnest purpose to foster the interests of the INTERNATIONAL DENTAL JOURNAL. In connection with this an important address was made by Dr. J. Morgan Howe in reference to the obligation of the members of the company to give their strength to this periodical by so placing their papers that they will be assured of publication in the INTERNATIONAL DENTAL JOURNAL. The reports presented exhibited a year of very satisfactory work in the business relations, and it was also apparent that the profession were beginning to realize the importance of sustaining a periodical devoted exclusively to its interests.

FIRST DISTRICT DENTAL SOCIETY OF NEW YORK.

THE annual meeting of this Society took place on the 18th, 19th, and 20th of January, and was carried through nearly according to announcement.

The attendance, while not equal to former occasions, was satisfactory, some two hundred from various sections of the country being present. These mainly composed the meeting, as the members of the dental profession from New York and vicinity were exceedingly limited in number. This fact created a good deal of comment and had a depressing effect upon those who took part. The weather was exceptionally bad, and contributed its share towards the feeling prevalent that this meeting was not equal to those which had preceded it in former years. Several of those who had accepted appointments failed, both in person and papers, to be present, but notwithstanding this the time was fully occupied by essays of excellent quality.

Whether this meeting is an indication of a growing feeling that local celebrations have had their day, or whether it means simply a temporary loss, it must be recognized that there are indications that it will be more and more difficult to secure the co-operation of the profession at large in holding these conventions with the enthusiasm that was formerly in unstinted measure accorded them. Indeed, we question whether they have not outlived the possibilities for usefulness, heretofore so freely conceded.

This, if it be true, is to be regretted, as they have certainly had a stimulating effect in the past very nearly equal to the more pretentious yearly gatherings, and have elicited the warm interest of persons widely separated, thus cementing bonds of professional friendship and advancing scientific interests.

MICHIGAN STATE BOARD OF EXAMINERS.

"No diplomas are recognized from any institution where requirements for graduation are not up to that of the University of Michigan."

This is the law of Michigan, according to a report on another page.

It would be well for colleges to commence at once the study of this department of Michigan University, or else decline to accept students from that State. When will the era of absurd laws cease?

MASS-MEETING OF DENTISTS IN NEW YORK CITY.

A MASS-MEETING of dentists is to be held in New York City, on Tuesday, March 29, at 8 P.M., at the Masonic Temple, Twenty-third Street and Sixth Avenue. This is to be an important meeting in the interest of the Dental Protective Association, and is intended to stimulate dentists to co-operate in the work.

Obituary.

DR. CHARLES P. PENGRA.

DR. CHARLES P. PENGRA died at his home, No. 130 Dartmouth Street, Boston, Mass., at one o'clock A.M., January 31, 1892, aged thirty-one.

The earlier portion of his life was spent in Michigan, and at the age of nineteen he had completed the course of study in the Medical Department of the University of Michigan; but on account of his age his degree was withheld until the following year, 1881.

In 1883 he received the degree of Pharmaceutical Chemist from the same university.

During 1881–84 he was assistant to Professor V. C. Vaughn, University of Michigan, the eminent physiological and sanitary chemist.

In 1884 he assumed the chair of Materia Medica and Botany in the Massachusetts College of Pharmacy, Boston.

He was for the past five years Professor of Dental Histology and Microscopy in the Boston Dental College. Both of these positions he held at the time of his death.

He was a Fellow of the American Association for the Advancement of Science, and of the Massachusetts Medical Society, and was a member of the Convention for Revision of the United States Pharmacopœia, 1890.

He was an original investigator, being especially known for his researches upon the purification of water by freezing.

The frequent contributions which have appeared in various scientific journals from his pen have made his name familiar.

Professor Pengra was a favorite with his classes, being clear, thorough, and possessed of a rare faculty of interesting his students in the subjects which he taught, and the Faculty of the Boston Dental College feel that they have lost an able instructor and efficient working member of the teaching force. Therefore, be it

Resolved, That this expression of their appreciation of Professor Pengra's valuable services, together with the above memorial, be spread upon the college records, and also that a copy be transmitted to his surviving wife, to whom the Faculty tender their sincere sympathy.

Resolved, also, That a copy be sent to the leading dental journals for publication.

George F. Eames,
S. P. S. Sharpless,
Joseph King Knight,
Committee for the Faculty.

Bibliography.

Chart of Typical Forms of Constitutional Irregularities of the Teeth. By Eugene S. Talbot, M.D., D.D.S. Published by the Wilmington Dental Manufacturing Company. Philadelphia, 1891.

The author who has accomplished one work of real scientific value is generally satisfied to rest on the laurels earned, but Dr. Talbot goes from one point of vantage ground to another, leaving nothing undone in the search for a possible hidden fact worthy of being conveyed to his readers as a valuable lesson.

The work before us, termed very modestly, and yet appropriately, a chart, will serve to those who use it rightly as a thorough exemplification of certain typical irregular forms. We hear much of "saddle-shaped arches," "V-shaped arches," the "semi-saddle-shaped arch," etc.; but it is questionable whether the average professional man has more than an indefinite idea of what these technicalities mean.

The special life-work of Dr. Talbot seems to have been to show the importance of certain facts in the etiology of irregularities, and, if possible, to trace the origin of these various forms. The extraordinary labor which he has devoted to this, and the very considerable expenditure of means, are beyond the realization of those not familiar with the work; but probably the examples are not many of more intense devotion and persistent self-sacrifice in or outside the dental profession. The honor it has brought him has been well deserved, and while, doubtless, his labor has been made to arrive at scientific facts, it still remains for him a personal monument, to be appreciated more and more as the labor of dental science begins to approximate to the level of his investigations. That it has not yet reached that point will, probably, be acknowledged.

This chart is but another evidence of this excellent work. Here are presented in leaves, fourteen by ten inches, sixteen lithographic plates, beginning with the normal skull with a regular denture, to the "excessive development of the superior maxilla," the "arrest of development of the superior maxilla," the "arrest of development of the rami of the inferior maxilla," the "arrest of development" causing receding chin, and so on until the representations of the "V-shaped arch" and "saddle-shaped," etc., are fully and perfectly illustrated.

The original work of the artist was very superior, and while we cannot feel that these lithographic copies are equal in beauty and perfection of execution, they are very satisfactory both in design and color.

We can most cordially commend this chart as a means of instruction and study, as these figures represent types from which a great variety of modifications can be formed. Those who would make themselves familiar with these forms of irregularities of the superior and inferior maxilla can have no better guide than this chart, and by this objective lesson will be able to follow the text of this author more intelligently.

Current News.

MICHIGAN STATE BOARD OF EXAMINERS.

THE annual meeting of the State Board of Examiners in Dentistry convened in the Senate chamber this afternoon for the purpose of the examination of the applicants for a license to practise dentistry in this State. The last Legislature made the College of Dental Surgery of the University of Michigan the standard of comparison in the examinations of this board. No diplomas are recognized from any institution whose requirements for graduation are not up to that of the university, and a resolution to that effect was adopted with reference to the applications of parties graduating from colleges whose requirements were below the standard at the present meeting. The fee for examination is ten dollars, and for registration without examination, for those holding diplomas from recognized colleges, three dollars.

The board consists of three members, all officers, and the doctrine of evolution is enforced by law in the organization. One member is appointed each year for the term of three years, and he, by law, becomes secretary of the board; the second year he becomes the treasurer, and the last year the president, and should he be reappointed he takes his place at the foot again. The present organization of the board is, President, A. T. Metcalf, Kalamazoo; Treasurer, H. K. Lathrop, Jr., Detroit; Secretary, G. E. Corbin, St. Johns.—*Detroit Free Press.*

LANSING, October 28.

ST. LOUIS DENTAL SOCIETY.

THE St. Louis Dental Society met at the residence of Dr. Conrad, on January 5, 1892, and elected the following officers for the ensuing year:

President, Dr. George Robitoy; Vice-President, Dr. Walter M. Bartlett; Recording Secretary, Dr. J. B. Vernon; Corresponding Secretary, Dr. John G. Harper; Treasurer, Dr. Henry Fisher.

Committee on Publication.—Drs. Helmuth, Lindsley, and Keith.

Committee on Membership.—Drs. Morrison, Hickman, and Spaulding.

Committee on Ethics.—Drs. Baird, Prosser, and McNamara.

The Executive Committee consists of the officers of the Society.

Regular meetings are held on the first Tuesday of each month, excepting July, August, and September.

JOHN G. HARPER,
Corresponding Secretary.

800 PINE STREET, ST. LOUIS, MO.

MISSISSIPPI VALLEY ASSOCIATION OF DENTAL SURGEONS.

THE annual meeting of the Mississippi Valley Association of Dental Surgeons will take place March 8–11, 1892.

L. E. CUSTER,
Secretary.

THE POST-GRADUATE DENTAL ASSOCIATION OF THE UNITED STATES.

THE Post-Graduate Dental Association of the United States will hold its Annual Meeting, April 29 and 30 next, at the Leland Hotel, Chicago.

Dr. W. C. Barrett, of Buffalo, N. Y., Drs. T. W. Brophy, Louis Ottofy, and others, of Chicago, will present essays and addresses. An interesting programme has been arranged and a good attendance is expected. All members of the profession are invited.

Graduates of recognized Dental Colleges may become members by paying membership fee, one dollar, and dues for one year in advance, one dollar.

F. S. TENNEY,
Secretary.

96 STATE STREET, CHICAGO.

ORAL SURGERY IN NEW YORK.

DR. G. L. CURTIS, of Syracuse, N.Y., announces in another place that he has established himself in New York as a specialist in oral surgery. The importance of this labor in our large cities can scarcely be over-estimated.

Dr. Curtis has laboriously prepared himself both at home and abroad in surgery, and doubtless will find in that city an ample field for the practice of his special work.

Selections.

RUDOLPH VIRCHOW.

Rudolph Virchow, whose seventieth birthday was recently celebrated throughout the civilized world, justly ranks as the foremost pathologist of this century. Before the appearance of his work on "Cellular Pathology" our conception of pathological processes was based for the most part upon philosophical speculations. As one of his pupils, Professor Klebs, has recently said, it was Virchow who taught us to think microscopically, to read in the book of Nature, and recognize the minute pathological changes which had escaped the scrutiny of his predecessors. Virchow's axiom was *omnis cellula e cellula*, or as he says in his "Cellular Pathology," the cell is really the ultimate morphological element in which there is any manifestation of life. The demonstration of these views in his inimitable lectures effected as complete a revolution in medical thought as the French Revolution did in political economy. The development of bacteriology and subsequent investigations on cell life have served to modify some of Virchow's views, without, however, detracting in the least from their value. In his work on "Morbid Growths" he laid the foundation of our knowledge of neoplastic formations, and his numerous contributions to the pathology of various diseases, which are scattered through the *Archive of Pathological Anatomy* and other publications, have shed light on many subjects which previously were merged in obscurity. His writings on public hygiene, epidemiology, and military medicine have played an important part in effecting sanitary reforms. Although, strictly speaking, a pathologist, and always ready to uphold the independence of pathological anatomy, Virchow has never failed to recognize the claims of the clinician, and it is to him that we owe the intimate relation which pathology now bears to clinical medicine. Before his time there were great clinicians, but not scientific physicians in the true sense of the word, and many of the great medical authorities of the present day were trained under his guidance. —*Editorial in the International Journal of Surgery.*

THE

International Dental Journal.

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Original Communications.[1]

PYORRHŒA ALVEOLARIS DUE LARGELY TO SYSTEMIC PREDISPOSITION.[2]

BY C. N. PEIRCE, D.D.S.

A FACT well recognized is that heredity and adaptation are important factors in the production and modification of organs as well as of organisms, and that when these are once established in harmony with a comparatively stable environment, they become so fixed that they are, through successive generations, reproduced with comparatively limited variations. So when deviations from the recognized forms occur, we may naturally look for the factor which has been instrumental in causing this divergence; and in doing so endeavor to place it, when found, either in the line of ancestral traits, in one of those modifications arising from effort of adaptation to a new environment, or to a new use or a disuse of the parts, or to the influence of some specific poison with which the patient or individual has been recently inoculated.

Though man, in his ancestral line, far exceeds the limits of definite knowledge, he is evidently still much younger or more recent

[1] The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

[2] Read at a meeting of the Odontological Society of Pennsylvania, February 13, 1892.

in origin than many other mammals, but yet old enough to have become so fixed in his prominent physical characteristics that each individual of succeeding generations is hopefully expected to be not unlike the ancestral type. But, notwithstanding this hereditary and adaptive influence, there are constantly appearing local minor modifications, peculiarities, or abnormalities, which, wherever located, are such an expression as to interfere with either symmetry, function, comfort, or that economy for which nature is so constantly struggling.

The etiology of such abnormal manifestations is a matter of deep and continued interest and anxiety to the physiologist, as well as the pathologist, for to successfully anticipate, combat, or correct these unfavorable conditions, this knowledge of their etiology is of the greatest importance.

While, as above expressed, they are in position local, the inquiry comes with much force, are they wholly due to traumatic influences, or are they the local expression of some systemic condition, and located in the special field or district, because of a predisposition of the tissues, structures, or organs involved? There are several such abnormalities to which reference might be made, but in order not to confuse the subject for this evening's consideration, one only shall receive attention at the present time, and that one in its progress and results is so familiar to you all that I need simply name it. The tissues involved are the alveolus, the alveolo-pericemental membrane, and the cementum of the root. And while the results of pyorrhœa alveolaris are so disastrous, yet it is usually regarded as a purely local affection, both in origin and influence. There are, however, some associate lesions usually accompanying it, so that it may, with a good degree of appropriateness, be estimated as being largely under the direction of a systemic predisposition. In recording the history of its progress I shall endeavor to note the evidence in favor of this theory. The structure of the dense tissues involved is too well known and appreciated to need repetition; but a few words regarding the soft or more vascular structures may not be out of place.

This tissue, with its blood-vessels and nerves, which connects the cementum of the tooth and the inner wall of the alveolus with the arterial and nervous systems we shall designate, as above, the alveolo-pericemental membrane; its office is regarded as functional, physical, and sensory, and it is so arranged as to closely invest the root of the tooth and fill the space between it and its alveolus; protecting the cementum of the root at times beyond the alveolar bor-

der up to its union with the enamel, and below the apical end to the limit of its bony surrounding. It is composed of fibres which are firmly fixed to the cementum and from that surface pass out in a slightly divergent direction, lying nearly parallel with each other, save the deviations which occur to give place to the blood-vessels, nerves, and lymphatics, to be embedded in the alveolus, and thus help to hold the tooth in position; osteoblasts which build up portions of the alveolar walls; cementoblasts which construct the cementum; fibroblasts for the augmentation or renewal of its fibrous tissues, and osteoclasts and cementoclasts for the removal of these tissues when stimulated by either physiological or pathological considerations,—all have a physiological importance. This membrane varies in thickness in different individuals, and in the same individual at different periods of life, or under different systemic or local conditions. The abnormalities to which it is liable are such as are common to all vascular tissues, but are much exalted in severity and results in consequence of the membrane being located between two unyielding surfaces. This root-membrane Charles S. Tomes describes as a "connective tissue of moderate density, devoid of elastic fibres, and richly supplied with nerves and blood-vessels." The fact that the "principal fibres" run across from cementum to process without break in continuity demonstrates it to be but a single membrane, so that one for the root and another for the alveolus is not a feasible proposition. On its inner aspect, where it becomes interwoven with the cementum, it is pictured by histologists as consisting of a fine net-work of interlacing bands, which are firmly adherent to the cementum. This surface, it is alleged by Tomes and Black, is richly cellular, containing large, soft, nucleated plasm-masses, which are the cementoblasts for the formation of cementum, and which, by their offshoots or prolongations, communicate with vascular masses within the cementum. The vascular supply of this membrane is derived from three sources,—the vessels in the gums or soft tissue covering the alveolus, the vessels in the bone, and branches of the vessels destined for the pulp-supply, the last being by far the most important and especially worthy of note, as will be seen from a subsequent paragraph. So please keep in mind that the tooth-pulp and the tissue, which is now our root-membrane, receive their blood-supply largely from the same source. Blood enters the tooth-pulp in great abundance; the dentine through the tubules is also well supplied, and these tubules, by prolongations, connect with cement-corpuscles or lacunæ, and these again are, through a multiplicity of little canals and vessels, brought into

close connection or intimate relation with the vascular membrane on the root. So between the pulp inside and the cemental membrane on the outside, there is in a normal tooth a continual interchange of living plasma, in addition to the supply which it receives from the vessels of the gum and alveolus. With this brief description of the alveolo-pericemental membrane, the tissue, the abnormal diseased condition of which is under consideration, we proceed to the origin and progress of its deviations from health. Dr. G. V. Black has very appropriately given us two terms to express the pathological conditions which are now known as pyorrhœa alveolaris, or "Riggs' disease," gingivitis, or *phagedenic pericementitis* and calcic inflammation, or better, *calcic pericementitis.* Pyorrhœa alveolaris simply expresses a flow of pus from the alveolus, and could as well be applied to acute alveolar abscess as to these chronic conditions. Of the two conditions designated by Dr. Black, it is our purpose to speak of one only,—*calcic pericementitis.* Gingivitis or phagedenic pericementitis may or may not be a systemic expression, though it would be quite safe to so regard it; while the other, calcic pericementitis, is regarded by many as a purely local affection, and yielding, if at all, to local treatment only. To those holding such views let one inquiry be made. Are renal and hepatic incrustations or accumulations to be regarded as wholly the result of abnormal conditions of the liver and kidney, or are they not rather due to some systemic condition wherein nutrition, appropriation, absorption, and waste are involved? Is it not a process of transformation, which is characterized by the deposit in these tissues or organs of various salts derived directly from the blood? We all know that calcareous deposition takes place in special localities or organs as a normal physiological process, as in the formation of bones and teeth; but when found in excess, or from these fields it is diverted and elsewhere deposited as an amorphous salt instead of an organized structure, and with a truly pathological result, shall it be stated with any degree of consistency or wisdom that the localities receiving it are the only unfaithful or treacherous members? I trust not. There may be foreign substances, living or dead, necrosed particles, trichinæ, shot, etc., which are sources of irritation, and which, for the protection of surrounding tissues, may become encysted. We may also have excementosis persistently progressing to the extent of greatly enlarging the transverse diameter of the root, but in such cases there is a local stimuli sufficient to excite the cell and call into play its power of multiplication without seriously disturbing its function of reproduction; but these

instances are widely different from renal and hepatic depositions, as well as from the serumal deposits upon the teeth, all of which, though only precipitates, at times become so extremely hard they cannot be cut with a knife, and yet they are only an amorphous or unorganized salt. Hepatic depositions rarely occur before middle life; out of four hundred cases collected by Hein, less than four per cent. were under twenty-five. The same could with truth be said of serumal deposits on the teeth, the larger proportion of cases showing no manifestation until after the age of forty years.

Morbid changes in the secretions, sedentary habits of life, errors in diet, are noted by Fried. Theod. Frerichs as being favorable to the formation of gall-stones, while a calculous diathesis is spoken of in connection with both urinary and biliary calculi. Ziegler, in his work on pathological anatomy, says, "concretions of calcium phosphate and carbonate deposited in the kidney constitute what is called calcareous infiltration." "It occurs chiefly in aged persons in whom resorption of the bony structures is active; but it may occur without such resorption."

While we recognize that biliary and urinary deposits are not identical in analysis with serumal or sanguinary deposits upon the roots of teeth, yet the urinary have in common with the serumal or sanguinary deposit a marked concomitant, "a calculous diathesis," and not infrequently where the former urinary deposit is recognized the latter is also found.

In over seventy-five per cent. of the cases of calcic pericementitis under my care,—and I have had, and now have, a large number,—induration of tooth tissue has preceded serumal deposit.

This *antecedent* is to me an important feature in the diagnosis and prognosis of the case. This filling up of tubuli and reduction of pulp-chamber and canals establishes the diathesis, and at the same time necessarily reduces very materially the blood-supply to the pulp, and, in consequence thereof, places the pericemental membrane for the time in a hyperæmic condition. We have already admitted the intimate blood-relation existing between these two vascular tissues. This change of tooth-structure we recognize as the first physical deviation from normality, with subsequent ones depending upon predispositions due to inherited or acquired tendencies.

This second deviation from normality we now recognize as occurring in the alveolo-pericemental membrane, and we designate it as a hyperæmic condition, showing itself visually and mechanically. To the eye there is more or less reddening and turgescence in the gum, irritation of continuity, while the tooth itself is, in

many cases, perceptibly elongated to give room for the congested and necessarily thickened membrane from the dilatation of the blood-vessels of the part and their repletion with blood.

This hyperæmic state may be described as being either active or passive; but in the conditions under consideration we shall, from results, assume that it was first active, inasmuch as we have an increased flow of blood to the parts inducing congestion, and passive to the extent of a reduced or diminished flow of blood from the part producing engorgment, over-distention of the vessels, to be relieved only by exudation; this increased quantity of liquid plasma transudes under pressure from the vessels. Let it be here recognized that this transuding plasma is that portion of the blood which carries the mineral element, the accumulation of which on the cementum of the root is at once patent in response to both its source and to its unavoidable presence. I repeat, unavoidable, for this transudation from the blood, with its calcic freight, is far in excess of the capacity of the lymphatics to carry away. So, from stasis of the blood we have stasis of lymph, with a saturation of the surrounding tissues far in excess of the normal degree. Shall we term this an œdematous condition, œdema of engorgment? Collateral œdema it is, for it is the effect of some previous condition.

Inflammation is now localized and present in full force,—redness, swelling, heat, and some pain, with a marked impairment, and in some cases the total arrest, of the function of the tissue involved. The conditions established are vascular disturbance, disordered nutrition, an accumulation of exuded plasma, an arrest of function, and a precipitation of calcic crystals in the shape of an amorphous salt on the surface of the root, which, while remaining in this position, reacts so as to exalt and continue the inflammatory condition. Now, what shall we consider the primary *noxious* element which causes an alteration in the vessels, disturbs or arrests their normal function, and excites inflammation? Is it possible that this injurious agent is brought to this locality in the blood itself? Can it be that this calcic material, which was first appropriated in solidifying the tooth, is now increased in such quantity as to be the cause of these clogged and altered vessels and of other conditions which are doing such irreparable damage, or is it only a sequence? To ascertain a correct explanation of these abnormalities these inquiries are made. One concomitant of it all must certainly be admitted the presence of a "calculous diathesis."

Another, and not the least important, condition is yet to be noted. The exudation has reached or assumed a purulent form,—

a whitish, milky, or yellow appearance,—and is now called "matter," or pus. This change has doubtless been through the influence of bacteria, infectious micro-organisms. The tendency of these organisms is to increase the breaking down or dissolution of the tissues, so that we now have formed a pus-containing cavity—an *abscess*—a *pocket*—from which, if without treatment, pus is continually discharged until the tissues are destroyed and the tooth drops out, or, to relieve discomfort, is artificially removed. In some instances, when left unattended, exudation undergoes putrefaction, and is offensive. The staphylococcus (so called from being in close cluster, like grapes) thrives, says Carl Frankel, at ordinary room-temperature, but multiplies far more luxuriantly when at a higher point. It *is not* a harmless concomitant of purulent inflammatory processes, as has been demonstrated by successful transmissions; these experiments proving without doubt its septic character.

We have given, as far as possible, a history of the origin, progress, and termination of calcic pericementitis, or pyorrhœa alveolaris, so termed.

The reasons for estimating it as being associated with a systemic predisposition are,—

First. It has invariably, as an antecedent, a calculous diathesis.

Second. The age at which it becomes manifest is in correspondence with similar renal and hepatic affections, rarely being under forty years.

Third. When treated to a comparatively successful termination, it needs constant watchfulness and care, else a few months will see it as active and virulent as in any previous stage.

Fourth. While under proper and efficient care with marked satisfactory progress, systemic disturbances with a limited period of neglect will not only retard repair, but will greatly exalt the inflammatory condition with all its accompaniments.

Fifth. Never is one tooth alone the victim of the disease, but organs on both sides of the mouth, as well as in both the inferior and superior jaws, extending ofttimes to the whole denture, are probable victims; and when once located on any tooth, not one in the mouth is free from the possibility of attack at a near or remote period.

Sixth. The great frequency at which it can be traced directly to an ancestral influence; fully ninety per cent. are of this character, and I deem it one of the strongest evidences in favor of its being the result of a constitutional condition.

Seventh. Ordinary salivary calculus may be present to a greater or less degree, even to the complete visual obliteration of all the teeth in the mouth; but when this is thoroughly removed, the trifling irritation at the gingival borders yields at once to the application of appropriate remedies, providing the serumal or sanguinary deposit is not present.

The treatment to be pursued is too familiar to the profession to need repetition.

PULP-STONES: THEIR SIGNIFICANCE, METHODS OF DIAGNOSIS, AND NECESSARY TREATMENT.[1]

BY DR. RODRIGUEZ OTTOLENGUI, NEW YORK.

WHAT is a pulp-stone? The name is applied to globular masses found either in the body of the pulp tissue or attached by a pedicle to canal walls. They are seen by microscopic examination to be of at least three varieties,—one having the appearance of secondary dentine, one presenting with true bone lamellæ, and a third being a combination of bone and dentine. The last is the rarest. It is not my purpose to discuss the histological aspect of this subject, the time allowed me by your committee for the preparation of this paper being too brief. I have, however, within my own experience, been fortunate, or unfortunate, enough to meet with many instances where this disturbance was the exciting cause of pain, and I have collated facts which may be of clinical value. These I shall now present to you for your consideration.

I shall begin by relating a few typical cases from practice, from which I may be able to draw some deductions.

CASE I.—Mrs. A., aged about twenty-six, married, no children. This patient was of phlegmatic temperament, cleanly habit, and in good health. Nevertheless, her teeth were blue-white, deficient in lime salts, excessively sensitive, and when caries occurred the destruction was usually rapid. Presented with a leaky amalgam filling in anterior proximate surface of superior first molar. This was removed, and some softened dentine found throughout the cavity. Upon attempting to remove this, the tooth was found to be very sensitive. The cavity was, notwithstanding, thoroughly cleansed,

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[1] Read before the Central Dental Association of Northern New Jersey, May 18, 1891.

the pulp was not exposed, but nearly approached, and because of the sensitiveness of the tooth it was filled with a probationary filling of oxyphosphate. The patient returned in two days, complaining that the pain which first brought her to the office had not been alleviated. Filling was removed and a minute examination made for a possible exposure, none being found. Was dressed with equal parts of oil of cloves and carbolic acid, covered by gutta-percha. Returned on the following day, and for two succeeding days, upon each of which the treatment was renewed. The history was that for a number of hours after each dressing the pain would be in abeyance, but upon assuming the recumbent position at night it would ensue with increasing severity. From loss of sleep and persistent pain, by this time the patient was growing excessively nervous and desirous of having the tooth extracted. I therefore decided to apply arsenic, and used the paste supplied by the depot. This application was made at ten in the morning. Patient returned at two in the afternoon, reporting that the pain was unendurable. Dressings were removed and various medicaments essayed to allay the pain, none of which produced any effect. Gave patient ether, not sufficient to produce complete anæsthesia, and natural sleep followed, which continued for three hours, when she awakened free from pain. She was dismissed for the night with a light anodyne dressing in the cavity. The pain recurred about two in the morning and banished sleep. At nine in the morning she reported, and I succeeded in removing only a slight portion of the dentine covering the pulp, when I was stopped by the extreme sensitiveness. I renewed the arsenical dressing and the experience of the previous day was repeated. It must be remembered that up to this time I had never seen a pulp-stone, and was entirely ignorant of diagnostic symptoms. To me there seemed nothing to do but to pursue the arsenical treatment till the sensitiveness should be controlled, and it was a mystery to me that such resistance should be possible. This treatment was continued from day to day, until at the end of four days I was enabled to cut away the dentine down to a hard surface which resisted an ordinary engine bur. It appeared of a greenish color, and was as large in circumference as the end of a small lead-pencil. This I drilled around and finally dislodged so that I lifted it out with an excavator. I found it to be a pulp-stone which entirely filled the pulp-chamber, and attached to it was the pulp from the palatal root. This pulp was stiff enough to stand erect when the pulp-stone was laid on the bracket, and when rubbed between the fingers felt gritty. The buccal pulps bled freely, and

could not be removed without further arsenical treatment. After their removal they were found not to exhibit any granulation that could be determined by the fingers, and undoubtedly they were the seat of the pain. The tooth was filled and no further trouble ensued.

Case II.—Miss R., a young woman, unmarried, aged about twenty, excessively nervous temperament, reported with toothache in a lateral incisor. Found a small opening into which a fine broach could be forced, causing pain, but no hemorrhage. Applied arsenic, and patient returned in two hours in torture. Anodyne dressings relieved the pain, and she was dismissed for the day with no further application of arsenic. On the next day the arsenic was renewed, and the unpleasant symptoms of intense pain ensued, necessitating removal as before. This was repeated for four days before the pulp could be taken out, when it came away in a single bloodless mass, appearing like a grain of rice, and nearly as stiff, being readily broken into distinct fragments. Strictly speaking, I suppose this was calcification of the pulp rather than true pulp-stone.

Several instances of this nature awakened me to the fact that persistent resistance to arsenic is a good diagnostic symptom of the presence of pulp-stones. I removed, from some cases, several stones before reaching a portion of the pulp which would bleed.

Case III.—Mrs. S., a stout married woman, very nervous temperament, aged about forty, reported that she had been in the hands of her family dentist who had treated with arsenic six times, resulting in torture, and no effect whatever upon the sensitiveness of the cavity. She presented with a note from her dentist asking me for advice and assistance, as he was mystified. From the similar experiences which I had had, I determined at once that pulp-stones were present, and considered this an opportunity to attempt a new treatment which I had decided should be essayed at the first chance. I administered nitrous oxide and kept the patient under its influence until I had drilled around and removed the pulp-stones. This was a lower second molar, and it was necessary to renew the gas as often as she appeared about to awaken before I could gain sufficient time to dislodge the pulp-stones during anæsthesia. I took out, as usual, first, one large stone, which covered the top of the chamber, and then found the chamber occupied with four others, a fifth and sixth covering the entrances to the canals. As soon as I had reached the soft tissue, I allowed the patient to awaken, when, to my disgust, I found the remainder of the pulp too sensitive to be removed. I dressed with oil of cloves and carbolic

acid, and the following day reamed out both canals, the patient being once more put under the influence of the gas.

Case IV. brings us to another feature of this disturbance. Mr. B., a man of thirty, presented with a superior second bicuspid, cavity deep and sensitive, but pulp not exposed. I filled with oxyphosphate as a permanent filling. Patient returned two years later reporting intense pain. The tooth being of good color, and not responding to any of the investigations in search of signs of pericementitis, the case was diagnosticated as pulpitis, due to the fact that possibly a layer of dentine which was carious had been left as a cap for the pulp, and that this caries had continued until it reached the pulp, causing the irritation. I will say, parenthetically, that this has never been my practice, but in this instance I supposed it might have occurred unintentionally. I removed the filling, and found the cavity walls hard and entirely free from caries. The pulp was not exposed, and the tooth was sensitive to the excavator. I dressed with oil of cloves and dismissed. The patient, however, returned the same afternoon, reporting intense pain. Though this was the first of this class of cases that had come to me, I diagnosticated pulp-stones, and proceeded upon my usual method. I was afraid to apply arsenic at the afternoon hour, because my patient could not reach me again that night. I determined, therefore, to extirpate the pulp under nitrous oxide, and did so, removing three pulp-stones from the entrance to the canal, and the remainder of the pulp on a broach.

Case V. was somewhat similar, but presented with most disagreeable after-results. The patient was a married woman, about thirty-five, and in good health. I found a badly-leaking gold filling in the lower second molar, involving the posterior proximate and crown surfaces. Upon removing the gold I found a phosphate capping in good order. Not deeming it a favorable position for gold, I filled with amalgam, and on the following day polished thoroughly at all points. In three days patient reported in pain, and after this had continued for three days more, I removed my filling and also the capping, whereupon the pulp bled freely and the pain subsided. I applied arsenic, not suspecting pulp-stones for an instant, because the surface of the pulp presented soft tissue. A night of agony followed, and patient came early on the following day in a nervous, weakened condition. I attempted to remove the pulp, and, though causing pain, did extirpate it from the pulp-chamber. Upon close examination, rubbing it between the fingers, I found entangled within its meshes five small globular masses which, when washed

in water, presented the usual appearance of pulp-stones. Exploration disclosed the fact that the pulp-canals were confluent, and the rest of the pulp was removed with a Gates Glidden drill, which, however, did not enlarge the canal. As there was a considerable hemorrhage, I dressed the canal with tannin and glycerin, covered with gutta-percha. The patient had a very bad night, and many more thereafter. It was two weeks before the tooth showed any signs of restoration to a comfortable condition, which only ensued after I changed the dressing to one of aconite and iodine, essential oils having been my first reliance.

Case VI. is very similar in its history to the last, and is introduced because of the large number of stones found. This was a married woman of forty, and the tooth also a second lower molar, the cavity occupying the anterior and crown surfaces. The tooth was filled with phosphate by her previous dentist, but for over a year had never been entirely comfortable. I removed the phosphate, and the pulp bled. I applied arsenic, which caused a night of wakefulness, and the following day I removed seventeen pulp-stones, all small, but distinct globules, the rest of the pulp being one mass of granular bodies interwoven with the tissues. Having reamed out both canals as thoroughly as possible, I came to the conclusion that the roots curved at their extremities so that a drill could not reach their foramina. With the dam in place, however, I did reach the ends by use of the Evans root-dryer. The canals, being thoroughly dried, were soaked with oil of cloves, dried out and soaked again, and then a dressing applied, which I left in for twenty-four hours, upon which I filled the root-canals with gutta-percha. About this time sickness occurred in the family, and I did not see the patient again for two weeks, when she reported that she had suffered pain. I therefore removed the filling in the roots and applied dressings for three days, whereupon I again filled them. As the cavity was a very large one, and the patient, with another similar cavity, had suffered much from the tediousness of prolonged filling, I determined to fill with gold at two separate sittings. At the time when I filled the roots, I also filled the tooth half full with gold and polished the proximate surface, intending to insert the rest of the gold as a distinct filling. The following day the patient came in accompanied by her husband, reporting that she had been compelled to take morphine injections the night previous. I was lucky enough to be able to reach both canals and remove filling without disturbing the bulk of my gold. Relief followed, but it was two weeks before I dared to refill the roots, an abscess having developed,

and even then I filled with cotton and oil of cloves, covering with gutta-percha, which was left in place for four months before I filled permanently. Then the roots were filled with gutta-percha, and the gold filling completed.

I must report one more case as typical of another point which I wish to bring out.

Case VII.—A married woman, aged about thirty. A lower second molar; pulp exposed. I capped and filled with phosphate, gutta-percha being used for the cap. This phosphate lasted four years, when it became necessary to refill the tooth. At this time I found the pulp had recovered itself, and therefore I filled with gold. Six years afterwards, or ten years from the time when the pulp was capped, I was compelled to remove the tooth because of a painful abscess. Examination made immediately after the removal of the tooth showed both canals filled with pulp-stones till near the extremity, the lower portion of the pulps being putrescent, and undoubtedly the cause of the abscess.

These cases will suffice upon which to hang my arguments and deductions.

Exactly what the histological process is which produces these formations, whether the odontoblastic layer secretes the lime within the tissue, as is claimed, or whether we accept Bödecker's idea that the odontoblasts are but medullary corpuscles, and that it is possible for medullary corpuscles to appear within the body of the pulp, subsequently producing the depositions under the stimulus of pabulum supplied by the blood-vessels. I think we may adopt the following theories:

We may consider that the pulp of a human tooth is the residue of the dentinal germ. During fœtal life this germ followed its function and produced dentine around itself, contracting its own size by the process. I think there is abundant evidence to substantiate the claim that this action is continued after adult life, though of course much less rapidly. That is to say, the canals of teeth are constantly decreasing in diameter by deposition of dentine. Now, we know that in all embryonic tissues there resides a mysterious intelligence which directs its actions so as to produce a given form. In embryonic life there is a period when, from microscopic appearance, man cannot differentiate between bone tissue and muscle tissue. Nevertheless there is undoubtedly a difference, at least in the element of intelligence, since bone will be invariably formed of a given continuity, and muscles occur with exactness of relation and purpose. If we cut off the end of a finger,

and nutrition is not impaired or disturbed, the inflammatory process which follows results in a return to embryonic conditions, succeeded by a rebuilding along the original lines, so that the finger-tip is precisely restored. Should there be a disturbance, however, between the relations of nutrition and organization, the result is a building of tissue, but it is unorganized, and the result is hypertrophy. This hypertrophy will be in line with the functional intent of the part, —that is, in bone we get an exostosis, while in the soft tissues we find a growth of soft tissue.

If we examine the pulp we find the conditions similar, but the environments are different. In the case of the finger-tip, nothing but the surrounding atmosphere interferes with the growth outward. In the bones, the exostosis is possible, because the surrounding tissues are soft and readily absorb before the growing bone. The pulp, however, is surrounded by bony walls, which do not yield readily, though Professor Peirce has just reported a case in which inflammation produced hypertrophy of the pulp and absorption of the canal walls to accommodate the increase in the size of the pulp. However, we may say that the action would be thus: If caries reaches the pulp, and does not cause its death, hypertrophy of the soft tissue will follow, the removal of the circumscribing wall at the point of caries allowing the pulp to grow outward, until we find it occasionally filling the cavity of decay. If, however, the inflammatory action is induced, perhaps by some micro-organism which has the power to penetrate dentine rapidly, before the pulp is actually uncovered two things may occur. The more likely result is the death of the pulp, caused by a supervening suppurative inflammation. If, however, the inflammatory action is dilatory, we can readily imagine a condition where the functionary activity being disturbed, the lime is deposited so rapidly that complete organization is prevented, and consequently we have a condition similar to that which would produce an exostosis in a bone. As the deposition, or bony growth, cannot be external, because of the limiting walls, the result is, the soft tissue of the pulp itself gives place to the bony masses, or dentinal masses, which we term pulp-stones.

If we accept this doctrine, we come inevitably to this conclusion: The sometime considered healthy action of a pulp in recovering itself is really a pathological action, and one which will not discontinue until the death of the pulp ensues, as in the last case reported; the canal is filled with pulp-stones until what is left of the pulp dies, when putrefaction, and subsequent abscess, is to be expected.

From the above I draw these conclusions:

First. Intense pain, without decrease of sensibility, following the use of arsenic, is a reasonable sign of the presence of pulp-stones.

Second. Intense pain following a probationary filling, whether immediately or after an extended period of time, there being sensibility in the dentine, and no symptoms indicating other disease, the pulp not being exposed, pulp-stones are to be suspected.

Third. Where it is suspected that pulp-stones are present, arsenic must not be used, and if it has been used once, it must not be repeated. The pulp must be extirpated under an anæsthetic.

Fourth. Where pulp-stones have been removed till soft tissue is reached, arsenic must not be used for controlling the sensibility of the remainder. It is preferable to use an anæsthetic.

Fifth. After the removal of pulp-stones, it is not safe to insert a permanent filling immediately; the canals may be filled, but should be covered with a readily removable probationary filling.

Sixth. If a pulp be exposed, capping must produce either its death or else set up an inflammatory action which will be followed by deposition of pulp-stones, which will ultimately strangle the pulp. It is therefore inexcusable to cap any pulp which has bled, especially in young patients.

PULPLESS TEETH; ABSCESS; TREATMENT, ESPECIALLY SURGICAL TREATMENT.[1]

BY J. M. PORTER, D.D.S., NEW YORK.

Every man beginning dental practice doubtless has his vision of the methods by which he can most quickly and surely relieve the pathological conditions coming under his professional care.

This vision may be the impressions made by a preceptor, or the result of clinical teaching. In either event his individuality will in time so influence his methods, that two men having the same preceptor and graduating in the same class will in a very few years pursue radically different procedures in attaining a given result. That men of large experience should differ widely as to the best methods by which a pulpless tooth can most surely be placed in a condition to be safely filled is not surprising. Thus, one endowed

[1] Read before the New York Odontological Society, January 19, 1892.

with conservative tendencies will unconsciously employ conservative means, while the man with more radical proclivities will adopt very different methods to attain the same result, and the process adopted by each will very generally bear the impress of his individuality.

In my early experience I pursued the more conservative plan, chiefly because my clinical teaching had been in that direction, but time and experience taught me there was a more excellent mode. I then thought it necessary to disinfect the pulp-canals and tubuli of a pulpless tooth for several days, or perhaps weeks, without regard to the physical conditions surrounding the case. For instance, no distinction was made between a case where the pulp had been dead for several months and there had been pericementitis, and the case in which the pulp had been dead but a short time without symptoms of inflammation. I did not take into consideration the age of the patient, which is a factor of much importance, and one not regarded as it should be in making a diagnosis. In those days I used creosote or carbolic acid as my usual treatment, but for the past five years I have used neither in pulpless teeth, with or without abscess. In the first class I will include those in which the pulps have recently died or been destroyed. In this some difficulty will be experienced in removing satisfactorily all of the pulp. Formerly, after removing the pulp, this class of cases was treated with carbolic acid or creosote, and when the patient returned a substance was found in the smaller portions of the pulp-canal, very sensitive to the touch of a broach and incapable of absorbing any remedy which I could use for the purpose of relieving this condition.

I now remove, if possible, all the pulp at one sitting, and immediately fill the pulp-canals. By the use of cocaine this result is accomplished without producing much discomfort or pain.

In the next class I will include those teeth with dead pulps which have never manifested any symptoms of pericemental inflammation. In such cases, especially if the patient has passed the age of forty years, I do not hesitate to fill at the time of second treatment, and in a few a filling is made at the first sitting. For instance, a patient of the last class mentioned called for treatment within a month. I found a large anterior approximal decay in the first right superior molar. The nerve had evidently been dead several months. There was no soreness on percussion, and after adjusting the rubber-dam and thoroughly cleansing the cavity, I found no defined pulp-canals. I thoroughly dried with hot air, then washed the entire cavity with alcohol, repeating this treatment a

number of times at this sitting, and filled immediately with gold, without having any subsequent unfavorable symptoms. This belonged to the class in which I regard immediate root-filling as being clearly indicated.

The next class will include pulpless teeth with soreness on percussion. Here would be an evidence of pericementitis, slight or serious, depending upon the degree of tenderness manifested, the significance of which experience alone will indicate. I am advised by a well-known dentist in this city, that in treating this class he never attempts to remove all the dead pulp at one sitting, but permits a portion to remain, treating with iodoform and sealing up the cavity for subsequent operation. I have always had the impression that disinfecting the tubuli was the chief object in the management of teeth in this condition, and certainly the chief motive where the pulp had evidently been dead for several months. How this process of disinfecting the tubuli can be best accomplished by leaving in the pulp-canal a portion of the dead pulp, through which the iodoform would have to act upon the tubuli, is a surgical proposition which I am not able to comprehend. I believe in getting direct contact with the tubuli and then using hot air to evaporate all the moisture possible, so that the process of disinfection can be hastened. The pulp-canals are then washed several times with alcohol, alternating the alcohol with the use of hot air, which method I believe to most quickly produce the conditions desired, so that the operation of filling can be accomplished without causing subsequent irritation. In the three classes of cases to which I referred I seriously object to leaving the pulp-canals unfilled any longer than is absolutely necessary, because this condition is radically unnatural, and it is a well-known fact in surgery that nature makes every effort to remove all unnatural or pathological conditions. The forming of a scab over a wound is a good illustration of the efforts of nature in this direction. Moisture, and especially air, are both irritants, and both doubtless detrimental to the process of healing. Hence the object of eliminating the moisture by the use of hot air and excluding the external air by permanently closing the pulp-canals. I firmly believe from experience and observation that many teeth have been lost by prolonged treatment, very many times from force of habit, without regard to the classifications I have made, and that pericementitis has been produced and maintained, where this complication would not otherwise have existed.

To treat a pulp-canal without removing all the dead pulp, or to place any medicine in contact with the walls of the pulp-canal

without first thoroughly evaporating the moisture with hot air, I regard as a very great waste of time, and very bad surgery. I do not presume to deny that an abscess may be cured by using carbolic acid or creosote placed in contact with moist tubuli, but that is not proof that there is not a more excellent method by which the same results can be accomplished more surely and quickly. When you recall the difficulties with which you contend in disinfecting the tubuli when filled with moisture, as compared with the results obtainable after thoroughly evaporating the moisture from the pulp-canals and tubuli with hot air, I am sure you will discard the former practice and adopt the latter. One such effort, thoroughly made, will convince any man that the tangible results from using hot air alternated with alcohol, as compared with the use of either carbolic acid or creosote, are so much more satisfactory that I am quite willing to take my chances on his returning to the use of the two remedies last named.

Another reason for not using carbolic acid in treating these conditions is the fact that it coagulates the organic contents and does not penetrate the dentinal tubules, and certainly will have a tendency to close the foramen, preventing free drainage, which is so essential in treatment of the class of cases now being considered and where a fistulous opening does not exist. As an injection through a fistulous opening, if one is used for the purpose of stimulating granulations, I should recommend boracic acid or sulphate of zinc. At one period in my experience I assisted for five years a surgeon with an extensive practice, and the one fact which he most impressed upon me was to not indulge in what he termed "meddlesome treatment." He said he believed this to be a universal fault among surgeons, and my observation since that time convinces me that his criticism may be truthfully applied to dental surgeons.

In considering the treatment of pulpless teeth with fistulæ, one very common error into which many have fallen is the conclusion which they universally seem to have reached, that an abscess will not occur on a tooth where the pulp-canal has been perfectly filled. I indulged in this erroneous belief for many years, until my attention was called to a case one night to lance an abscess, which I did not again see for two weeks, and when seen the opening made had absolutely closed and the tooth was normally comfortable. This condition of things led me to ask myself, Was this abscess caused by an imperfect filling in the pulp-canal? If so, and the source of the abscess yet remains, why should the fistulous opening close up so thoroughly and quickly without the use of medicine? I

consulted a number of professional friends, and they all emphatically assured me that an abscess could not occur on a tooth where the pulp-canal had been thoroughly filled, but none of them could give a reason for it, nor could they for its being cured without the usual treatment. I was unable to explain the origin of the abscess in this case, but I soon reached the conclusion that it was not caused by an imperfectly-filled pulp-canal. About this time another case was presented, which excited my curiosity and led me to make an operation, which I have made many times since with great satisfaction to myself and patients. This was a case of a pulpless tooth which had been filled fifteen years and had all the surface indications of being a most perfect operation. One year previous to the time I saw it, it had abscessed and the fistula had never closed. My first thought was, Is this another case in which possibly there is a defective filling in the pulp-canal? The character of the operation made this scarcely possible, as it was most beautifully done.

The next question was, If the pulp-canal is perfectly filled, why is this fistula maintained? It then occurred to me that in both of these cases the work had been well done, but in the first mentioned there were conditions existing favorable to the process of healing, and in the last they were unfavorable, and the result was, the first had been cured without the use of medicine in two weeks, and the second had existed a year, and was, when presented to me, a case of chronic abscess. Then I said to myself, if this be the true situation as to the conditions in the pulp-canal in both of these cases, then the maintaining cause in this last one must be outside the pulp-canal, but where? Passing a probe through the fistulous opening, I detected very quickly rough margins of process, and concluding these rough margins to be the maintaining cause in this case, I proceeded to thoroughly remove with my engine and a fissure bur all evidence of rough bone, leaving a margin which could not prove a source of irritation. At this stage in my experience, I still believed in the necessity of treating an abscess even though the cause had been removed. However, I concluded to omit my former practice and note the result. To my great satisfaction, in about two weeks I found the fistulous opening closed. I saw the case at least once a year for five years subsequently, and the abscess never returned. Since these two experiences, I have strictly adhered to the following mode of practice:

If a case be presented with the pulp-canal unfilled and fistula, I thoroughly evaporate the moisture from the pulp-canal with hot air, then wash the canals with alcohol as previously described, and

fill at once. If the abscess is one of recent development, I should give the case at least ten days after filling the pulp-canal, to determine whether or not the abscess was maintained by the conditions existing without the pulp-canal. If the abscess remained, I should then conclude that the maintaining cause was rough margins of bone, and should proceed as described to remove these rough margins, and have not found it necessary in such cases to resort to any further treatment. Thus, I am clearly of the opinion that two causes invariably maintain an abscess: one is the diseased condition which may exist within the nerve-canal, and the other is rough margins of process. If the abscess is of recent development, cleansing and thoroughly filling the pulp-canal as described will universally effect a cure. If the abscess has existed for several months, then removing the rough margins of process I have found to be necessary. If the maintaining cause of a recently-developed abscess was other than an unfilled pulp-canal, then simply filling the canal would not cure the abscess; and if after the pulp-canal has been filled, it still remains, and is then cured by removing rough margins of process, then, reasoning by exclusion, I must conclude that these must have been the originating cause.

Now, if either or both of these methods, whichever the condition indicated necessary, will produce a cure, then why use carbolic acid or creosote? I do not deny that abscesses have been cured by their use before and after filling the pulp-canal, but is such a result proof of the fact that their use is required? Extracting a valuable tooth may cure an abscess, but that is not proof that there could not have been devised a more excellent method by which the case could have been treated. There are many methods of accomplishing the same results, but to find out and adopt the best one is, I assume, our object in discussing this subject. I am an advocate of the operation of alveolotomy, where it is not possible to get access to an abscess without enlarging the apical opening, and where, if access is not gained, the patient will be obliged to suffer for many hours, and perhaps several days.

The two chief objections which have been urged against the operation of alveolotomy is, first, the injury which may be done to the surrounding tissues, and also the pain incident to the operation. As to the pain produced, I will say that by using cocaine the operation is not as much complained of by patients as the suffering which they have endured in most cases for many hours, and the prospect of relief from subsequent pain is also an incentive to have the operation performed. My personal experience is that the operation of alveo-

lotomy produces less injury to surrounding tissues than enlarging the apical opening for the purpose of getting access to an abscess. The opportunities for seeing what you are doing in performing alveolotomy, and the fact that nature will reproduce the parts removed, as contrasted with the uncertainties which characterize the operation of enlarging the apical opening, and the additional fact that the parts destroyed by this operation have to be reproduced by mechanical means, ought not to leave any doubt as to the fact that enlarging the apical opening in any case is a surgical operation which cannot be too strongly condemned. The only time in which I have found it necessary to extract and replant a tooth in the past five years for the cure of abscess was that of a superior central incisor in which the apical opening had been enlarged for the purpose of getting access to the abscess, and had been subsequently treated for thirteen months unsuccessfully by a gentleman of skill and large experience. Hence my belief that this operation ought never to be performed.

There is also the additional fact that nature finally relieves the patient by making an opening practically the same as would result from the operation of alveolotomy, and this surely is an excellent reason for anticipating nature in such cases and giving the patient relief. I have no doubt that there are many oral surgical operations which are very imperfectly performed. Three or four cases will illustrate my reasons for this conclusion: In one all the lower teeth to the left of the symphysis were lost by an abscess being badly treated on a left inferior first molar in the mouth of a little girl twelve years of age. The patient was brought to me after being treated seven months, and I considered myself fortunate to have been able to save the base of the jaw and the teeth on the opposite side. Another was a case of fracture of the lower maxilla, which had not been properly treated for four weeks when it was placed in my charge. The third was where a blow on the left side of the face had produced necrosis and the loss of the lower molars, and a fracture about one-half inch to the right of the symphysis. This case was presented to me in consultation three months after the injury. The fractured portions had not been adjusted, and four fistulous openings were discharging through the cheek. Such cases prove most conclusively that the field of oral surgery is not as yet given the attention which it demands by the dental nor by the medical profession. In proof of this statement, I will mention the fact that the last case described had been treated for three months previous to the time the patient was

brought to me, by two graduates of Jefferson Medical College, one of them being a gentleman of large experience. Right here the question naturally comes up as to the position the dental surgeon is supposed to occupy. Where does his work cease and that of the general surgeon begin? The field of oral surgery is one in which there are many opportunities for doing much good and greatly relieving humanity. Thus far, but few among the great number of dentists seem to fully appreciate its true significance and usefulness. It is a type of surgery which requires keen perceptive faculties, and the operator must possess a clear head, an honest heart, and a steady hand; and head, heart, and hand must work harmoniously together.

The advocates of carbolic acid and creosote claim that their use is necessary to destroy the pus-sac surrounding an alveolar abscess. They also claim that the destruction of this sac is essential to the cure. If the use of these remedies and the destruction of this sac is necessary, then why not necessary in the cure of abscess in any other portion of the body? I challenge any gentleman present to produce an authority on surgery in which the destruction or removal of this sac is advocated, or where it is claimed this has anything to do with maintaining an abscess on any other part. And yet in alveolar abscess, where the tissues surrounding the disease are peculiarly non-vascular, and where, if the osseous tissues were *not involved*, the conditions would be most favorable to the healing process, we are told by the advocates of the use of carbolic acid and creosote that they are absolutely essential to the cure of alveolar abscess for the reasons given. This sac is simply a barrier thrown out by nature to circumscribe the disease, and is not maintained by other than two causes, one of these being a diseased condition within the pulp-canal, and the other rough margins of bone. Remove these two maintaining causes, and the disease is cured, without the use of carbolic acid or creosote.

TOOTHACHE: ITS DIAGNOSIS AND TREATMENT.[1]

BY DR. A. V. ELLIOTT, FLORENCE, ITALY.

Mr. President,—What I had in view when I gave the title of the paper I intended to read before this Society to my friend, Dr. Bryan, the secretary, was the exigencies or emergencies in dental practice, more particularly in regard to what is generally understood as toothache: how quickest to diagnosticate and give relief. But I find the subject almost too comprehensive to be classed within such limits, and so I fear I must trespass upon your indulgence a little longer than I had intended. As human beings of the nineteenth century, and particularly as dentists, we are, of course, familiar with the subject. It is one, I think, of great importance to us, and especially to those of us who practise in such holiday centres as Lucerne, where so many go for health and pleasure; and of the many, there must naturally be a certain percentage of unfortunates whose anticipated pleasure has been turned to pain and misery by the toothache. But happily, in the providential arrangement of circumstances, it is within the province of the modern dentist to give relief to a greater or less extent. It therefore behooves us for the sake of humanity to lift the load, so to speak, from the weary sufferer as expeditiously as possible.

It is because I want to do my whole duty in this respect—to humanity and myself—that I have chosen this subject, so that I might give you the benefit of my experience for what it is worth, but more particularly so that I might receive in exchange from you the methods and remedies found most effective in your experience.

Toothache proper means inflammation either of the pulp or alveolo-dental membrane. Inflammation, as we all know, is that condition of living tissue which includes pain, heat, tension, etc.,—a want of physiological harmony in the parts,—and is occasioned by anything which would produce that want of harmony or health, as the intrusion of foreign bodies,—thermal shock, septic poison, etc.

The first and most important thing to consider when a case is brought before our notice is the diagnosis. To the patient who comes for relief, no matter what the cause of the pain, it is to him simply a toothache and nothing more, and that is sufficient. But to us as diagnosticians it is a matter of importance to know for a

[1] Read before the American Dental Society of Europe, at Heidelberg, August 5, 1891.

certainty what the real cause of the pain is: whether, for example, it arises from irritation of the pulp of the tooth from exposure, or of the periodental membrane, or because of some obscure pathological condition elsewhere. The diagnosis is not always an easy matter. We sometimes have to grope our way very cautiously to arrive at a full assurance of being on the right track. We must isolate the seat of trouble by elimination or exclusion. Ordinarily, when the patient presents for relief, we have little difficulty in discovering what the matter is. We find the cavity, and within it a pulp in a state of irritation; the proper remedy is applied, and the patient goes gratefully away. But we have mouths presented to us sometimes which embarrass us. There are crowns in every state of disintegration; root-canals in all stages of putrescence and the development of gaseous products. The patient suffers, and we are expected to give relief. We must get at the seat of this particular trouble by elimination, and leave the other potentialities for future development.

Again, there are more cases in ordinarily good mouths having no open cavities, but many teeth filled. There is at first sight no appearance of anything wrong, yet the patient suffers. The pain may come from exposure or near exposure of the pulp through a prolongation of a cavity not apparent to the eye, or the pain may arise from a metal filling placed too close to the pulp without adequate protection, or it may be developed from incipient inflammation about the root of a dead tooth. Impacted wisdom teeth are frequently painful to the patient, and osseous deposits in the pulp-chamber and canals; or the pain might have its origin somewhere else besides the teeth, and is felt in a tooth or teeth through the reflex action of the nerves. Rheumatic, gouty, hysterical, and neuralgic people, and women during gestation, are subjects of these irregular phenomena. I might include among the possibilities of pain from an obscure source fillings of different metals in contact, or near by, producing an electro-chemical action. This, I think, is more theoretical than real. I have never personally seen such a case.

In obscure cases we can be helped at times by questioning the patient as to the history of the trouble.

In reducing this matter of diagnosis and treatment to general principles, let us commence with the simplest first. Fortunately for us, these cases of difficult diagnosis are rare. The patients who come to us for relief are usually suffering from either inflammation of the pulp or of the alveolo-dental membrane. My plan is to

remove the *débris* and decalcified dentine in the cavity, being careful not to wound the pulp, and then fill with oxyphosphate, leaving enough of the decalcified dentine over the nerve to protect it, after first sterilizing it with bichloride of mercury. If the pulp should be found to be exposed, or nearly so, I make a medicated soothing pad, consisting of eugenol, oxide of zinc, and a few threads of Japanese paper or cotton-wool. This I place next the pulp, and, after taking up the surplus moisture from the pad with absorbing paper, fill the cavity with soft cement with as little pressure as the case will allow. I prefer Weston's for this kind of work; vaseline is good also; but a cement which does not knead up softly should not be used. I know there are many other ways of treating such cases, but this seems to me to answer all the conditions.

If a case presents itself where the tooth has given pain not persistent, and we find a prompt response to moderately cold water and yielding to a soothing application, my plan is to treat in the same way as for the other class, hoping for the best. But so much depends on circumstances and the individual case, the constitution and health of the patient, the location of the cavity, whether accessible or not. In this class we must use our judgment and be careful. If the patient has a violent and jumping toothache, aching persistently, especially at night in bed, I think the proper thing to do is to devitalize the pulp. I first apply something to reduce the pain, such as carbolic acid and morphine, oil of cloves, eugenol, or Rosenthal's remedy. I prefer eugenol, as it seems to leave the pulp in a receptive state for the arsenic. The latter I prefer to other agents, because it leaves the dead pulp in a better state for removal. At times neuralgia is more or less associated with trouble arising from inflammation of the pulp, which, however, usually disappears after direct treatment to the tooth.

Often when a case is presented, it is difficult at first sight to know if it is really a case of inflammation of the pulp, or if, it being dead, inflammation of the alveolo-dental membrane has commenced. The patient is feverish and apprehensive, and incapable of giving much assistance in the diagnosis. If it is a case of live or dead pulp, my plan is, that where there is a cavity of greater or less depth, to test with cold water, watching the expression of the patient; if the pulp is alive there is generally no mistaking the fact, and that point is settled; but in those cases where the pulp is affected by an improper filling which has developed trouble, we may be obliged to arrive at the truth by the process of exclusion. I think it is best to decide that where there is no marked indication there is inflam-

mation of the alveolo-dental membrane. We must search for cavities, sound suspected teeth to develop tenderness if any exists. We must study the color of the gum, must interrogate the patient as to the symptoms, and when we find as a result of the examination that a certain tooth is more sensitive than others to concussion, and that the patient complains of a dull, heavy pain, and reports that the tooth seems to be longer than the others, and that drinking of hot liquids was painful, and cold not so, we may, I think, with confidence bore into that tooth to give a vent to the confined gas, thus giving relief to the patient. If the vent gives no relief by removing the pressure, we must "do all things to conciliate; failing in that, all things to crush." Toothache of this kind is one of the most distressing ills that human flesh is heir to, and owing to its situation and the nature of it, it is often difficult to give that speedy relief the patient longs for. Owing to the pain, and the absorption into the system of more or less poison, constitutional disturbance of a greater or less degree is associated with this kind of trouble, and must be taken into consideration.

The first thing indicated is to reduce the inflammation and prevent its further progress. If suppuration has not already advanced too far, blistering pads (I make mine of red pepper and cocaine, sewed up in little bags nearly covered on the surface with chlorapercha, or strips of felt covered with wet gum tragacanth and pepper dusted over that; the gum softens in water, but does not dissolve), aconite and iodine, or strong iodine, can also be applied. I recommend a hot foot-bath, a dose of Epsom salts, and six-grain doses of antipyrin, or apply one or more leeches over the root. A lotion of cocaine, aconite, chloroform, and iodine, rubbed somewhat forcibly on the gum with the end of the finger, has a benumbing effect. Failing to get relief within a reasonable time by our efforts to reduce the inflammation, we must now turn our attention to hastening the process of suppuration and the discharge of the pus. Hot poultices,[1] having two or three drops of laudanum on each, should be applied, so as to assist the pointing to the right direction. If the pain is persistent in spite of these efforts, it is well to give an opiate. I recommend to be taken before going to bed fifteen or twenty drops of laudanum, or chloral hydrate ten grains, and bromide of potassium ten grains. Usually after the sleep thus produced the patient has no more pain. A subcutaneous injection

[1] We presume the writer means upon the gum. Poultices upon the cheek are not admissible.—Ed.

of morphine (one-sixteenth of a grain) would answer the same purpose, and sometimes better.

I had a case in point to illustrate its efficacy. A lady sent for me who was suffering greatly on account of an upper wisdom tooth on which had been placed a Richmond crown. The pain defied every effort to reduce it until she had received two injections of morphine, after which, on awaking from her sleep, the pain had entirely left, and there was no suppuration. In these cases of crowns and bridges we have not the alternative of extraction. The question of extraction is an important one,—to know when it is expedient and proper to resort to it.

There are hopeless cases where the use of the forceps would be a mercy, and a possible insurance against much misery in the future. But judgment, qualified by honesty of purpose, should rule before the dentist yields to the suggestions of the patient and his own convenience, and extract a tooth that might, if properly treated, be retained as a useful member of the dental arch.

Erosion or wearing down of the crowns often gives rise to more or less annoyance, if not positive pain, to the patient. This condition of things, often found in the mouths of strong and healthy people, indicates a want of proper tone and solidity of the teeth, or of a solvent in the mouth which acts upon them. The only thing to do is to cover with gold. Chloride of zinc gives temporary relief, and so does the nitrate of silver. But if the case be beyond filling, the nerve should be killed and removed. The same with erosion on the buccal sides of teeth, which I consider as being different from the other class, as the erosion seems to be local and confined. The solvent in this case must come from the mucous membrane directly opposite and in contact. In cases where all of the teeth seem to be sound, but their necks exposed and the gum in an unhealthy state, it is difficult sometimes to locate the pain. The patient himself is not sure of the tooth. Sounding gives no response, cold water sets all the teeth aching, as does cold air. Ordinarily, the pain passes away with the effects of the exciting cause; at others, however, it is persistent. The cause of it is exposure,—not enough covering over the cementum, which is not as thick over the nerve or as dense as dentine, and needs the further protection of bone and gum. In such cases we must be patient in the diagnosis to isolate the tooth giving the present trouble. I have given relief in such cases by boring into the tooth and inserting a little eugenol, sealing up with gutta-percha. This method has the advantage also of testing the tooth as to its vitality. In some cases, however, where the destruc-

tion of tissue is very great, the only thing to do is to kill the pulp, after being sure of the right tooth. In all cases of this kind, and in those where sympathy might tend to mislead one, there is nothing for it but the exercise of patience and perseverance. I had recently some experience myself in regard to being misled by sympathy. I had a toothache which I thought was in the left superior canine. Paradoxical as it might seem, I rejoiced at the idea. I wanted to experience clinically on myself the different phases and symptoms of toothache. I did not ask for sympathy, which is not usually given to dentists, but when I was unable to find any cause for the pain myself, and it was growing unbearable, I consulted my friend, Dr. Schaffner, who, not finding anything apparently the matter with that tooth, commenced sounding all the teeth on that side, and when he reached the wisdom tooth I responded. Up to that time I had no suspicion that there was anything wrong with that tooth.

We must in these cases, which include persons of the rheumatic and gouty diatheses, women in gestation, etc., proceed with caution, and in cases of doubt do too little rather than risk doing too much; be governed by general principles, and for the moment treat the parts topically, and recommend systemic treatment. We are a long way off as yet from perfect knowledge; we must leave some work for the dental societies and the investigators of the future. I would much rejoice, in the interest of suffering humanity, if we could discount the future a little, and obtain a way by which the agonized patient, in a case of acute periodontitis, for example, could be surely, immediately, and painlessly relieved.

SOFT GOLD-FOIL AS A FILLING-MATERIAL.[1]

BY DR. C. H. GERRISH, EXETER, N. H.

I SHOULD have made my subject read *non-cohesive foil*, but use the term soft, as cohesive was hardly known in the days of my early practice.

Probably most of you are as familiar with the manufacture o gold-foil as myself, but would like to ask a question or two, whicl may come up in the discussion.

Given an ingot of pure gold, from this same product is mad

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[1] Read before the New England Dental Society, October 29 and 30, 1891.

cohesive, semi-cohesive, and non-cohesive, or, as I term it, soft foil. How are these different results obtained? and how can soft foil be made less cohesive?

You are well informed as to the fact that cohesive foil loses its welding properties if long exposed to the air, by gases or other impurities. Heat expels them and restores the original properties of the foil, but to what treatment can we subject soft foil to increase its non-cohesiveness? Is it a trade secret?

There are teeth that cannot be saved by filling. You have met with them, and so have I. Whatever material is used you will wish your choice had been different; but granted that the quality of the teeth is such that filling will preserve them, one has to choose from the many materials at hand.

In the order of merit I consider "gutta-percha" or Hill's stopping as the very best. Next comes *tin-foil*, then soft gold-foil, and, last in the list, cohesive and the many forms of gold which require welding in their manipulations, while the plastic fillings, such as the oxychloride and phosphates, are uneven or uncertain in their results, yet, nevertheless, indispensable, while amalgams come in to cover for us a multitude of sins, tiding over many a troubled sea, and saving more teeth than any one of the above-mentioned materials, and possibly more than *all* of them put together.

For the present I would ask your attention to some advantages that soft gold possesses over cohesive for permanent fillings. Hill's stopping and tin-foil respond too quickly to the wear and tear of mastication. Why does the farmer plug the tap-hole of his cider-barrel with a spile made of pine rather than some hard wood? Simply because he loses no cider, there being no leakage. For the same reason a boat-builder stops up the holes made in his planks by the withdrawing of nails or screws with some soft wood.

The plug must be softer than the material into which it is driven. When you put a soft-foil filling into a tooth, you have these same conditions present. You will agree with me that it is not the most solid filling that preserves the tooth, but rather the one that is the best adapted to the inequalities of the cavity, especially the marginal walls,—the one which excludes air, moisture, and germs, and includes sufficient hardness to withstand the action of mastication.

In all these requirements soft gold stands foremost. It is impossible to make as hard a filling as with the cohesive, though it will be dense. It is like putty: though you work it never so long, when you have finished your labors it is putty still; you have

not changed the character of the material. Again, the arrangement of the cylinders in a soft filling is more conducive to a perfect stop.

Will you bear with me while I describe briefly my method of preparing and working the foil? I use Abbey's foil, Nos. 3 and 4, nothing heavier. Take a sheet and fold the edges together, once, twice, thrice, smoothly, making a ribbon of eight thicknesses of foil, about one-half inch wide, then roll or twist into a coil or rope, being careful to keep the surface of the foil smooth. Now with scissors cut the same into pieces just long enough to suit the cavity to be filled. By that I mean that one end of the coil shall touch the bottom, the other projecting just beyond the orifice. With your tweezers or pliers you take up a piece of foil and carry the gold into one corner or angle of the cavity, cut end down, so the coil shall stand on end, condensing towards the distant wall. Using the side of your plugger, another piece is placed alongside, and still another, until you reach the other angle. The size of the cavity is now reduced. Repeat this operation until your last coil is in position. Now with the point of the plugger condense the surplus gold projecting above the tooth, keeping the same well over the cavity. This is important. In condensing the gold you will find the weak places in the plug. Send the instrument well to the bottom of the cavity, using lateral wedging pressure. Fill up this pit and look for another. If possible, make these pits a little way from the enamel of walls, so as not to mar or grind the tooth under the instrument. Each piece of foil introduced in this way acts upon the filling as the key-stone to the arch, the filling being a series of arches. After this is gone through with to your satisfaction, use your burnisher, and use it thoroughly. And just here, gentlemen, are the saving qualities of soft foil seen; your surplus gold in a great measure disappears.

What becomes of it? Every piece of gold presents its edge or end to the action of the burnisher (shall I liken the filling to a bunch of asparagus standing on end?), and the action of the burnisher has forced, swaged, moulded, or moved the mass in the same manner, but to a less degree, "than the warm burnisher does the gutta-percha plug," bulging the gold outward towards the walls of the cavity, filling up every inequality and securing for you a perfect stopping.

Now, for a moment, contrast the effect of this instrument, the burnisher, upon a cohesive filling. Your last layer of foil has been welded (the bunch of asparagus is not end up now), the marks of the

plugger still visible; these you can burnish out after a fashion; but how much impression can you make upon the preceding layer of foil? how about the ones put in during the early stages of the work? But you add that the plug was made solid as you went along, and it is fortunate that it was. Now a combination of the two foils can be made combining most, if not all, of the saving qualities of soft foil, and affording the tone and finish of the latter.

I start the filling with soft foil, working in the manner I have described, only taking more time to condense the gold as the use of the burnisher, which I emphasize so strongly, is prohibited; therefore the plugger is used a longer time.

A sheet of No. 3 cohesive foil is cut into four pieces, these pieces rolled into coils, each coil cut, making two or three short ribbons; pass one of these ribbons through the blaze of an alcohol lamp, taking care not to burn the foil. Some operators make a mistake in the use of heat. The less used, and sufficient to work your foil, the better the filling will be. With the foil-carriers set it against the plug, and with rather a coarse instrument carry it across one edge of the filling; then, with a fine-pointed instrument, work it persistently; retrace your steps over the same place; add another coil, working on the former cohesive part, and overlap onto the soft filling slightly. The advantage of this method is a perfect weld. The question was asked me if I had any difficulty in welding cohesive foil onto a soft filling. In the way I have described, never. In fact, I never made a filling entirely of cohesive foil.

Coming back to our subject proper, consider for a moment the conditions prevailing in the early days. No engines, automatic pluggers, mallets, rubber dam, hardly any serrations to the points of the pluggers; in fact, almost all the appliances used by the modern dentist were wanting. Place yourself under those same conditions, and subject cohesive foil to similar tests to soft foil, and compare results ten or twenty years hence. How many of these old soft-foil fillings have you condemned? I mention this only to emphasize the saving virtues of the material itself.

Again, soft foil can be used with a minimum loss of tooth-substance, especially in approximal cavities of the incisors. I believe in the free use of files and chisels. Soft gold demands it, but the manner of working the same by wedging enables the operator to fill without cutting a direct opening to the cavity.

Again, the soft foil may be abused, yet hardly change its character; but not so with cohesive: it responds quickly and resents every abuse. Virtue goes out of it at the first, and these conditions

require a generous opening or channel, and often that is made from the labial surface. This result, while it caters to the vanity of a few patients, filling the heart of the operator with pride, is, nevertheless, poor taste, and falls short of true art, which is to conceal our work, reserving the effects of jewelry for artificial teeth.

I do not think the art of filling teeth with soft foil an easy one to attain, for it requires much time and practice, and the results are not so pleasing to the eye. In appearance they do not compare with cohesive work, but they have one strong virtue, they are honest, even better than they look, as the fillings of Drs. Wetherbee, Pray, and Johnson, done thirty, yes, forty, years ago, show to be. I have reached the conclusion that the man himself is greater than or superior to his school or methods, but I ask you not to let go of all the ancient landmarks. Instruct your students in the art of making soft-foil fillings; there is merit in them. They are to dentistry what bread is among our food-supplies.

A NEW PREPARATION OF GUTTA-PERCHA.

BY WILLIAM H. ROLLINS, BOSTON.

In setting crowns of porcelain with platinum pins extending into the roots, and for setting gold crowns and caps, I find a filling made of vermilion and gutta-percha of service.

This is readily made by mixing together with heat and careful working one part of gutta-percha and three parts of vermilion. This combination resists the destructive action of the mouth much better than the usual combination of gutta-percha and oxide of zinc. For buccal cavities, where the ordinary gutta-percha filling softens on the surface, it is of value. A whole list of gutta-percha stoppings can be prepared without the use of oxide of zinc, which are interesting from an experimental point of view, and I shall hope at some future time to report on these. The combination of iron oxide with gutta-percha is one of these, and favorable results seem to have been obtained with this mixture, but it is a matter of years to determine the relative value of these fillings.

Reports of Society Meetings.

NEW YORK ODONTOLOGICAL SOCIETY.

A REGULAR meeting of the New York Odontological Society was held on January 19, 1892, at the New York Academy of Medicine, No. 17 West Forty-third Street, with Vice-President Dr. Brockway in the chair. The secretary read the minutes of the previous meeting, which were approved.

On motion the usual order of business was dispensed with, and the paper of the evening taken up.

Dr. J. V. Porter then read the following paper, entitled, "Pulpless Teeth; Abscess; Treatment, especially Surgical Treatment."

(For Dr. Porter's paper, see page 255).

DISCUSSION.

Dr. J. N. Farrar.—The essayist's paper has in it so much in harmony with my own views that there is not much room to discuss it. I use non-escharotic creosote in the treatment of pulpless teeth that are not associated with abscesses,—I mean wood creosote in combination with alcohol. The object of the alcohol is to enable the creosote to act in the presence of aqueous moisture, if there should be any in the tooth.

The plan of drying teeth with hot air is excellent, but I think that bibulous paper will extract about as much water as the heating process, unless this is kept up for a long time. I do not regard moisture in the dentine as injurious to the tooth, but the pulp-canal should be dry. If there are no abscesses, I do exactly the same as the essayist mentioned,—fill the canal at the first sitting, if I have time. If I do not have that, I close it tightly. The great trouble with many dentists is that they fill temporarily with cotton saturated with some kind of drug, and then do not seal tight the canal. It should be sealed with something that will prevent any kind of micro-organisms from entering. I use phosphate of zinc cement over the cotton. When permanently filling a pulp-canal, I generally plug the apex with gold. What is needed is a small wad of indestructible substance. In early practice I did the same occasionally, but generally I used creosoted cotton, but I had not been

in practice long before I found that some of my own as well as other people's cases would begin to annoy the patients after a while. Upon removing the filling of several, it was found that this cotton underwent decomposition by being soaked with moisture, entering it through the foramen. This decomposition was what made the mischief. Then I saw more clearly than ever the value of the use of indestructible material at the apex. Gutta-percha has the same fault as cotton. It being a vegetable substance, it decays in time at the apex of the root. There are many cases, however, in which those materials never cause trouble. But any vegetable matter is liable to decompose, and bring about irritation of the socket. If the canal is perfectly clean, and the apex is properly filled with something that is indestructible, and the main canal filled with phosphate of zinc or gutta-percha, then there is not much liability to future difficulty.

An abscess at the apex of the root is, in one sense, nothing more than a deep-seated boil,—a kind of a whitlow. A very small amount of decomposed pulp shut in at the apex, as is often the case, will in time cause irritation, leading to thickening of tissue around the apex of the tooth ; afterwards the part of the thickened peri-dental membrane and adjacent tissues about the apex of the root, will break down and then there is a sac. This sac is nature's barricade to protect the system from blood-poison.

Common sense suggests that the treatment of such cases should be to get at that irritating substance, whatever it may be, and let it out. The old practice was to enlarge the foramen of the root, and treat it through this hole until it was cured. We might as well attempt to pour water into a bottle that is already full, as to try to force medicine into a sac already full, unless the foramen is enlarged considerably; but this drilling the foramen larger is liable to form a sharp edge around the hole. To drill this sharp edge, Dr. Atkinson used a small excavator. It is a poor plan.

Nature is our best guide in these matters. She makes a fistulous drainage from the socket. Drilling through the gums and socket, to the interior of the trouble, is the only scientific plan of treatment of a case containing pus. I derived so much benefit from this treatment that in 1878 I gave a course of lectures on it, at two colleges. If any persons are sufficiently interested in the results of my labors in this line, they will find them published in the *Dental Cosmos* for July, August, September, and October, 1878; and in the *Missouri Dental Journal* for April, May, June, July,

August, September, and October, 1879. These eleven papers contain a great deal of experimental detail.

The ragged bone that the essayist speaks of is generally necrosed bone. After an abscess has found vent through the side of the socket, the sac changes in its character. It hardens, in a measure disappears, and if the alveolar process behind the sac is deprived of its nutrient supplies it dies, and the sac dies in consequence, leaving a chamber filled with liquid substance. I call these cases *sepulchral* abscesses. The proper treatment, of course, is to go in there and cut all the dead part out; cut with a sharp bur until the healthy tissue is reached; sometimes, however, it is difficult, if not impossible, to get all the dead bone out. In such instances there may be a temporary relief. Even if there is left some carious bone, it may, after a time, die,—become necrosed.

Sometimes the end of the root projecting into this cavernous place itself takes on a degenerative condition. In fact, often the ends of these roots are rotten. Those cases formerly plagued me very much. Once I had a case that was favorable to amputate the root, and I did so. Of course that left the opening into the pulp-chamber enlarged, so that it had to be filled with gold wire to make it tight; but the process cured the abscess, and since that time the amputation of roots has, with me, been a common practice. I published this operation, among others, in the *Dental Cosmos*, March, 1884.

Concerning creosote as a remedy, I look upon it in this way: if a sore is on the outside, an ulcer, we would not use creosote, nor would we use creosote in a flesh abscess just under the surface; we might perhaps wash it out with something mild, such as castile soap and water, but with bone abscesses, we are dealing with something different. Iodine preparations are disagreeable because they discolor, but they otherwise do very well. Regarding the cauterization of the interior of the sac, I do not quite agree with the essayist. I think it is proper to cauterize the interior of a sac. Of course there is no such thing as a "pyogenic membrane," but there is a sluggish surface which should be removed. When this is destroyed, and the parts are treated with some simple liquid, such as table-salt and water, injected every day or two, until that degenerated substance is all driven out, and the contents are prevented from becoming rancid by continuing injections of salt and water, Labarraque's solution, or wood creosote and alcohol (which is non-escharotic) once in five or seven days, it will generally be followed by healthy granulations and a cure. For cauterization of a sac I

have found escharotic creosote (coal tar creosote), or sulphate of zinc, as effective as anything. Either pump it through the canal of the tooth until it appears at the mouth of the fistula, or inject it through the fistula with a syringe.

Dr. Darby, of Philadelphia.—I have been much interested in the paper just read, but I do not know that I am prepared to discuss it. There are, however, a few points upon which I may say a few words.

The essayist spoke disparagingly of the use of creosote and carbolic acid. These are medicines which have been used in dentistry from time immemorial. Especially is this true of creosote, and, although it is not absolutely essential in a dental practice, it certainly has served, and is still serving, a very good purpose in the treatment of devitalized teeth and chronic alveolar abscess. We all know that many a sac at the apex of a root has been broken up and a fistula healed by the escharotic effect of good creosote. The same may be said of carbolic acid. There may be better remedies than either of these, still I am not yet prepared to abandon altogether good English creosote made by Squores, of London.

The essayist spoke in high terms of hot air for drying the canals of teeth. But, to be effective, it must have pressure behind it to force it into the root of the tooth. Some years ago I put into my laboratory an apparatus for giving me compressed air. It consists of the following:

A cylinder, made of galvanized iron, holding one hundred gallons, with a pipe running to my office, and at its end a gauge to denote the number of pounds pressure. A stop-cock within reach of the chair and a rubber tubing reaching to the mouth of the patient, with a Taft hot-air syringe, and a little spring cut off, to be held in the hand. In the laboratory, in close proximity to the cylinder, is an air-pump, and each morning the man pumps into this cylinder compressed air, anywhere from five to thirty pounds. By simply holding the bulb of my Taft hot-air syringe in the flame of my small Benson burner, I can have any degree of heat desired, and sufficient pressure back of it to force it into the root of the tooth.

To me this apparatus has been almost invaluable, as I am enabled to dry a tooth more thoroughly than I have ever been able to do in any other way.

I would indorse all that the essayist has said about the free use of alcohol for cleansing the root, but much prefer the absolute alcohol to the ninety-five per cent., which is commonly used.

Whenever opening a devitalized tooth, in which I suspect septic conditions, my practice has been to put into the pulp-chamber a few crystals of the permanganate of potassium, and then washing it with a solution of the same. After which I dry it with the hot-air blast. Then wash it with the absolute alcohol, and then dry it again, this time with as much heat as the patient will endure.

In regard to the substance which shall be used for filling the canal, I do not think there is much choice between several. The point is to get something into it that will thoroughly seal it.

Cotton has been recommended, and in Philadelphia there are some who must believe in it, for they certainly use it a great deal. Dr. Farrar has said that cotton decomposes. I am not an advocate of this method of filling roots, but candor compels me to say that I have often removed cotton from the roots of teeth years after it had been put there, and the roots seemed in a healthy condition and the cotton was not decomposed.

But there are better materials than cotton. If gold could be carried to the apex of the root in all instances, I would prefer to put it there, and fill the balance of the canal with oxychloride of zinc. This, in my opinion, is the ideal filling for the roots of teeth. It is antiseptic, is plastic, and, if well introduced, makes a perfect sealing of the tooth. Teeth that have been thoroughly cleansed, and then thoroughly filled with oxychloride of zinc, seldom have an unpleasant odor when opened.

I agree with the essayist in his belief that drilling through the end of the root for relief in acute abscess is not often attended with pleasing result. My own experience and observation teaches me that the practice is a bad one, and leads to difficulty when it becomes desirable to find the root. But I must take issue with him in the other surgical operation which he so highly commends,—namely, cutting or drilling through the alveolar process. This may do very well for the six anterior teeth, or for teeth with a single root, where the length can be ascertained, but when the abscess is at the apex of a double- or triple-rooted tooth, the operation is too uncertain.

Dr. G. Lenox Curtis.—Perhaps the best way to present my views of this paper will be to describe my own method of dealing with the class of cases it describes. This description has necessarily, owing to a pressure of other duties and the brief interval permitted me for preparation, been hastily and perhaps imperfectly thrown together.

The important thing to consider, when a devitalized tooth pre-

sents, is how to prevent the formation of an abscess, if that has not already occurred. Right here judgment and ability on the part of the dentist are required, and the manner in which he acquits himself will show the stuff of which he is made. Unless he lays the foundation in correct principle and skilful manipulation, the superstructure, of after treatment, will fall.

The first step is the thorough removal of the entire pulp *débris*, without which it is impossible to fill the canal properly. The opening up of the canal is best done in most cases with the flexible engine drill. There are comparatively few roots which cannot be opened up by this means to the very end; in the few which cannot, a fine flexible probe of piano-wire, lubricated with a drop or two of carbolic acid, can be passed, with a little force, nearly, if not quite, to the apical foramen. The only exceptions to the rule to open the canal its entire length are those where the root is extremely crooked, rendering perforation likely, and those in which calcification has taken place. In the young the root-canals are much larger than in older persons, and there is, therefore, greater necessity for opening the canal freely. Too many operators make the fatal mistake of not cutting away sufficient of the tooth to allow the drilling to be done on a line parallel to the direction of the root.

The next step is the perfect cleansing of the canal. Simply forcing the ground-up dentine out by means of an air or water syringe, and then swabbing with cotton pushed into the canal as far as the probe usually employed will carry it, will not answer. That is not perfect cleansing, and is far different from what I mean. Too few dentists, I am afraid, have the proper instruments for accomplishing what I wish understood by perfect cleanliness, which is a task requiring time and patience.

My method is, first, to prevent, as far as possible, the entrance of moisture into the canal during the drilling; then, having desiccated the powdered bone with a blast of hot, dry air, I work into the canal with a rotary movement a delicate, tapering probe, frequently withdrawing it to carry out the power adhering to its sides. This procedure is continued till the powder is completely removed. The hot blast is then again applied until the patient complains of discomfort from the heat, when Darby paper-points are used to ascertain if there is any moisture remaining at the extremity of the canal. Sometimes it will occur that serum or blood oozes from the vessels at the end of the root, and finds its way back into the canal, a fact which can be only ascertained by the measure just noted, unless the exudation is considerable. (When the apical foramen is

large, or the root not fully developed, as in the teeth of young persons, it is difficult to check the extravasation of blood, requiring delicate surgical treatment to heal the wound before the filling of the canal should be attempted. When the filling is inserted, precaution must be taken against too much pressure upon the freshly-healed surface, or the wound may reopen and complications follow.) With the tooth dried as far as the heat will penetrate, the remaining moisture in the canaliculi is absorbed, and the canal is ready for filling, unless the pulp is putrescent, the treatment in which case will be stated further on.

For filling root-canals I have tried cotton, gold, amalgam, and cement, and long since discarded them, because, in my judgment, it was not possible to do perfect work with them. Not one of those mentioned can be made to enter and fill the canaliculi, which is an important part of the operation, as lessening the possibilities of the decomposition of the animal matter of the dentine. Nor can any one of them, in my judgment, be perfectly adapted to the walls, with the possible exception of cases where the roots are straight and short, and can be freely reamed out. I therefore use for filling canals that which it seems to me has fewer objections and more desirable properties than anything else known to me,—namely, chlora-percha.

My method of introducing the chlora-percha is to flood the canal with chloroform, and, placing the patient in a position which will assist in the expulsion of air from the tooth, work the chloroform with a delicate probe to the end of the root. The thorough diffusion of the chloroform is, I believe, greatly assisted by capillary attraction, owing to the extreme dryness of the tooth. This is immediately followed by the introduction of gutta-percha canal-points, which, by the aid of a to-and-fro motion, are dissolved in the chloroform along their entire length, forming the chlora-percha, which is distributed into every portion of the interior of the root accessible. Point after point is forced in, and placed in this manner, until the entire canal and the open canaliculi are filled with the chlora-percha.

I employ this method in all devitalized teeth, providing, of course, where the pulp is putrescent, for its deodorization and sterilization. This, however, is a simple task; hot water and hot air are usually sufficient, few, if any, medicaments being required. Where pericemental inflammation exists, I prefer the tincture of iodine to any other dressing, though some of the derivatives of this drug, as iodoform, aristol, etc., will accomplish perhaps equally good results by longer application. I see no necessity for the use of car-

bolic acid or creosote in the treatment of this condition, except to avoid a greater and more obnoxious odor.

I am opposed to treating alveolar abscess in any other way than by a positive and accurate procedure,—amputating the root, etc.

For a number of years I relied entirely upon therapeutic measures in this trouble, among them the injection of carbolic acid and creosote, although I employed the latter very rarely, partly because of its objectionable odor and partly because of my belief that carbolic acid was better. It was generally necessary to enlarge the apical foramen and force the medicine through, in the hope that its escharotic effect would destroy the sac and fistula, and thus the disease eventually disappear. Usually this method consumed much time, and only those that could well afford the luxury of such treatment received it. The greatest care is required in the use of carbolic acid lest it should accidentally come in contact with the gum. I have not infrequently observed much damage to the alveolus following its employment.

Early in my practice I realized the importance of positive surgical treatment in alveolar abscess, and for eight years I have employed that method almost exclusively, and, I am glad to say, with almost universal success.

After the root has been cleansed and filled as before described, the next step is to complete the filling of the cavity in the tooth. This should be a permanent operation, as the tooth is never again to be opened. A local or general anæsthetic is now resorted to, as the patient or the case requires. If the fistula exists, the probe usually leads directly into the sac or the excavation in the alveolus, which is invariably present. If there is no fistula, or if it is at some distance from the seat of trouble, a direct opening into the sac must be made. For this purpose I prefer a spear-pointed drill, which is thrust through the gum and alveolus in a direct line with the root. It is simply a matter of practice and delicacy of touch to know where to drill and when to stop. A rose bur of suitable size is now inserted and rapidly revolved, to cut away the sac and necrosed bone. If the apex of the root is necrosed, it is likewise burred away, or if the necrosis is extensive, so much of the root is amputated as is necessary.

Amputation usually requires a larger opening through the wall of the alveolus, and in extreme cases a flap of the gum and alveolus is turned back to allow room for the saw and for the removal of the diseased tissue. Then cleanse the cavity and check the hemorrhage

Hot-water injections will usually stop the bleeding, when an opportunity is afforded for ocular examination. Sterilize the wound, and if it is large, pack with antiseptic lint, continuing the dressing until no longer necessary. The antiseptic dressing may consist of injections of suitable solutions to aid in the healing of the parts.

If the operation has been inconsiderable, the wound may be left entirely alone after injecting with hot water and removing the *débris*, with the expectation of a cure. Even a fistula at some distance, necessitating a false opening into the sac, requires little or no treatment and soon disappears.

In the large majority of cases the amputation can be accomplished at the time the root is filled, but to impress upon you the importance of immediately curing all classes of abscess with fistulous opening, it is only necessary to remind you that wherever found they are usually tubercular. If the antrum or nares is penetrated by a fistula, special treatment is commonly necessary.

I believe that in no case should the root-canal be left open, because so long as it remains open, resolution at the end of the root is practically impossible, owing to septic influence at the base of the newly-formed tissue, which again breaks down, unless the risk is provided against by immediate filling. To enlarge the apical foramen only complicates matters, by rendering more difficult the adaptation of a perfect filling, besides endangering the integrity of the new tissue by the likelihood of the filling-material being forced beyond the root apex.

The operation of alveolotomy is to my mind based upon a rational view of health and disease. An abscess is nature's way of getting rid of a disturbing influence, and often considerable damage to the surrounding parts and great suffering to the patient are the outcome of her efforts to dislodge the intruder. The indication is, therefore, to assist nature by removing the affected tissue which cannot be restored to health and usefulness. My vote is therefore for surgical procedures in both acute and chronic alveolar abscess, —some differences in the care of the two forms are required,—because experience has taught me that it is the best and quickest method to assist nature to assert herself.

And now allow me a suggestion or two as to why so many teeth remain abscessed. Is it due to lack of knowledge as to what the disease is and how to find it? Is it because the practice of the average dentist is too full of the ordinary work to allow sufficient time to treat these cases when they are found? Is it because he

does not know just what to do, how to do, and when to do? Does the general office work keep him from special study and accomplishment in the direction of surgery? Has he not sufficient confidence in the honor of some dentist of his acquaintance whom he knows to be successful in this line of work to warrant his sending patients to that expert for treatment in his specialty, with the full expectation that operations coming within the province of the general practitioner's accomplishments will not be attempted? Is there danger in such a course of loss of the patient, or of uncharitable criticism of the dentist who does not do surgical operations or of his work?

It seems to me that each of these conditions exists to some extent, and that their existence tends to retard progress, to prevent our doing our full duty towards those who confide in us, and who expect from us the best that knowledge and skill can accomplish. This is not as it should be, and I think I see the dawn of a better day.

As has already occurred in medicine and surgery, the time has come for the establishment of specialties and special practitioners in dentistry; when men adapted by training or temperament to a particular branch of practice shall consecrate themselves and their energies to that field. Certainly one who with the proper foundation does so devote himself to a special phase of practice should be most capable of judging of the necessities for specific operations, and be best calculated to perform them. To me it is a pleasure to feel that this happy state of affairs is just before us, and I have no hesitation in predicting that ten years from now there will be comparatively few general practitioners of dentistry.

Dr. Crouse, of Chicago.—When I came into the room and remained for about five minutes, I had a sensation that I was probably in a kindergarten; and then my attention changed to something else, and the same sensation came over me again when the next speaker took his place, and now, Mr. President, I do not know just how I do feel.

I have heard the discussion of alveolar abscesses, although I have not read the paper. I tried to be in two places at once, and tried to hear two papers, one here and the other at the lower part of the building, and therefore did not get either. Yet I am delighted to speak on this subject, which I suppose is the treatment of alveolar abscesses.

I would like to take up the last speaker first, because I might forget something in his argument. These surgical dentists, these

men who get surgery chronic in their minds, think that the only way of doing anything is by a surgical operation. If there is any place I would steer my patients clear of, it is the office of one of these surgeons,—the one who thinks his work is to cut and slash all the time.

The trouble with surgical dentists is that they work at the wrong end. I have treated a great number of alveolar abscesses, and I have never found but three which did not get well with the treatment I will describe.

I happen to be in a field of colleges always productive of a great deal of surgery. We have five or six colleges in active operation. Do you not pity the patients when they have to submit to so many surgical operations a day? A law prohibiting dental surgeons or surgical dentists from operating, I think, would be a good thing. It might be a hardship to those who want to practise, but it would be a great blessing to the dear people.

What is the treatment I advocate? It is a simple matter, especially simple since we have the rubber-dam, and can dry out the tooth and prevent the medicine from coming in contact with the tissues. What is the operation? Prepare your cavity; it is not necessary to give the details, except that care must be taken not to force the broach into the pulp-canal, or get the cavity clogged with foreign matter; take a piece of soft india-rubber, cut it as near the size and shape of the cavity as you can; fill the cavity with carbolic acid, place the india-rubber into the cavity, and with it force the carbolic acid out through the fistulous opening. This is readily done with a blunt instrument and sudden force against the rubber, such force as is used in packing gold by hand-pressure. In my hands this has been the most effectual way of accomplishing the treatment. One such treatment is generally sufficient.

The frequent treatments described by the former speaker as being a luxury I am inclined to think my patients would not enjoy. I may be mistaken, and if I thought they wanted the pleasure of coming often and going through all that surgery, I do not know but I could work myself up to it.

Dr. Darby spoke of a class of cases where the pulp died under an oxychloride cap, and the root was found to be dry. In such cases I think the ends of the roots become encysted, and it is better to leave them alone than to treat them.

I do not like to speak on a paper that I have not heard, and if there are any points that I have not hit, I will be glad to know what they are.

Dr. Curtis.—I would like to hear some one challenge Dr. Crouse's views. I fancy he was joking.

Dr. Crouse.—For fear some one will so regard it, I will say that I am perfectly in earnest.

Dr. Van Woert.—In my preparation for the discussion of this paper, I was obliged to confine myself to the small amount of data contained in the short synopsis given in the regular notice. Therefore it will not be as complete as I should like to have it. In the first place, the notice says that the essayist will define his reasons for not using carbolic acid in the treatment of pulpless teeth and alveolar abscess. In my opinion it makes very little difference what theory may be advanced for not using carbolic acid; the fact remains that when you want to be absolutely certain, and count on results, you must accept the inevitable, and fall back on this old, reliable agent.

We are all ready to hail with delight anything that may possibly do away with the use of this offensive drug, but as yet there has been nothing presented, to my knowledge, that can take its place. Carbolic acid has made a reputation for itself that I fear it will be hard to kill. My experience with the substitutes offered, so far, has been anything but satisfactory, and I am confident that Dr. Porter will regret it if he abandons its use.

Second. The objection to leaving nerve-canals open in all cases where a fistula exists. When this is the case, I can see no reason for leaving the root-canal open. After freeing it from the septic matter with which it is clogged, it is my practice to fill at once.

Third. I am a strong advocate of immediate root-filling in all cases, for the following reasons: When a case of apical pericementitis presents itself, or any of the difficulties following, it is plain that such is the result of one of two causes,—either mechanical injury or the presence of septic matter in the roots. If the latter, by removing the cause and restoring the parts to a thoroughly aseptic condition, nature, in ninety-nine out of a hundred cases, will take up the fight and set matters straight without the aid of surgery or medicaments.

Fourth. The enlargement of the apical foramen I consider, as a rule, a bad practice, but there are cases where it is permissible and even advisable. The extraction and replanting of the tooth is at times really necessary; for instance, in excessive curvatures or malformations of the roots.

Fifth. I am a little surprised at his reasons for performing alveolotomy. I did not suppose there were any in this advanced age

of surgery who would wait for the disease to produce a fistulous opening. I thought it was the practice to operate at once when cases of this kind presented themselves. Of course, the kind of operation depends entirely upon the state of advancement the disease is in when presented. The operation of alveolotomy would seem to me unnecessary in most cases.

As I purpose following these remarks with my treatment, it will be a very easy matter to see why I take this stand.

Sixth. I fail to quite understand his reasons for surgical treatment in chronic abscess after the canal has been filled. If he means that no medicament whatever is to be used, I cannot agree with him. On the contrary, should he mean that by gaining access for evacuating the sac by surgical means, after which medicaments are used for the treatment of the case, I fully concur with him.

Now, in vindication of what I have just said, I give the following as my reasons for using carbolic acid and the objections taken to the points raised by Dr. Porter.

I think if the gentlemen who have talked of the different preparations for filling roots will try out of the mouth the experiments that I have suggested on several occasions, such as oxychloride, chlora-percha, gutta-percha, oxyphosphate, or gold, and then immerse the tooth in an aniline dye for five or six hours, after which thoroughly dry, then, by splitting them open, it will be found that the entire length of the root-canal is thoroughly stained. This will be found true of any substance that changes after having been placed in position. Therefore I do not consider any of them proper materials for this operation. I want something in the canal that will remain just as I place it; and I am happy to say I have such a preparation in my office, which is giving great satisfaction to a number of the members of our profession as well as myself.

The originator of the compound, as I understand, was Dr. Bronson, who gave it to Dr. Lord; and it was through Drs. Lord and Parker that I first learned of it.

Originally it was a combination of iodoform, zinc oxide, and vaseline, and, to do away with the disagreeable odor, I substituted iodol for the iodoform; and later on I changed the proportions and added to it oil of cinnamon. The following is the formula as I now use it:

Iodol, gr. x;
Zinci oxidi, gr. xx;
Ol. cinnamomi, gt. v;
Vaseline carbol., q. s.

Mix at a temperature of 140° F., to form a stiff paste.

This paste is so thick and dense that it can be rolled into shape very similar to the gutta-percha points manufactured for filling root-canals. It is immaterial what the temperature of the surrounding parts may be, you cannot get inflammation enough to cause the least change of the vaseline, a difficulty which I had in the beginning from macerating the mixture cold.

And here I would add another very useful remedy to this; one that I find of great service in acute cases of pericementitis: One part tr. capsicum to two parts vin. opii.

This, applied on absorbent cotton, a small piece of felt, or blotting paper, will relieve pain quicker than any local application I have ever tried.

And finally, let me add one more word in favor of carbolic acid. In my opinion, sustained by a long experience, carbolic acid is the one of all drugs the results from which you can depend upon. There has been a number of theories advanced for discarding it, one of which is the coagulation of albumen in the roots; and yet, notwithstanding this, the effect is satisfactory; and until we can prove all that is brought against it, we had best stand by it as an old friend. I sincerely hope that this paper will not influence any of the younger members of the profession to discard so valuable an agent.

On motion, a vote of thanks was tendered to the essayist and the gentlemen who discussed the paper.

Adjourned.

JOHN I. HART, D.D.S.,
Editor New York Odontological Society.

AMERICAN DENTAL ASSOCIATION.

DISCUSSION OF DR. KOCH'S PAPER.

(FOR abstract of Dr. Koch's paper, see page 213).

Dr. Abbott.—I think the paper is very good, but I do not like the general criticism that is thrown out, that colleges or faculties sell their diplomas for a specified sum of money. I do not think this is fair, and particularly coming from a man who holds no diploma and knows little or nothing about the conduct of colleges. I think he speaks feelingly in his paper. He is in a community of colleges so thick that you can hardly shoot without hitting one or another. But he should not judge all institutions by a few bad ones of his acquaintance.

I believe that the State Boards of Examiners are all very well n their way, but I am convinced that no State Board should be llowed to examine a single man who does not come to them with diploma from a reputable college to start with. I do not think it s fair to take a man who has been refused by the faculty of a den- al college, and then let him practise, after an examination. A law ught to be made to change that in some way.

Dr. Crawford.—Outside of the scientific questions pertaining to he art of dentistry, in my judgment the question of legislation is he most important one that addresses itself to the dentists to-day. shall not speak of the ethical side of the case. I shall look, for few moments, to the legal aspect of the question. Not a lawyer, ut a man who claims to have a limited degree of common sense, I old the right to my opinion upon a question that I regard of great mportance, not only to the dental profession, but to the people of he United States. One plea in the paper was that the people de- nand it, and that the people were interested in the enforcement of he laws. If you put it upon that plea, I shall certainly claim the uestion on the other side, because it is a fact that there is not a ufficient number of competent dentists in America to serve the merican people; therefore the discouragement of legitimate insti- utions of learning is contrary to their best interests, because they re not supplied with a sufficient number of men to fill the want.

I am unfortunate in not having had a college education. I re- eived my education in a local school-house, yet I say that the ental colleges of America should not be abolished. While the eople need protection, these institutions need some encouragement. here is a position in this case that I would accept, and that is, let ach State in the Union say that any person holding a diploma from reputable institution of learning shall be admitted to practise ithout further examination; but in the same connection giving ach board the power to pass upon the diploma that the student olds. That is maintaining the doctrine of State rights which some f us regard so highly.

The law in Tennessee is a model on this point, and I think it ould stand a good test,—that when the board has passed favorably pon the college, a man is entitled to respect from a legal stand- oint, if he holds a diploma from such an institution. An ulcer pon the body of the educational system will be driven away hen this is done in all States, because these boards will pass idgment on those who run disreputable colleges, and say that eir practice is not conducted for the best interests of the people.

I think it is the duty of every man to move an injunction against institutions of that kind. Bring it into discussion and you need not legislate it, because it will soon go out of existence on account of the want of patronage.

I hope that the dental profession will deal with it. When the matter was before the Legislature of the State of Tennessee, I asked each member what he thought about it. Every single one of the honorable body of senators said a diploma from a reputable college ought to be recognized. Nine out of ten people whom you ask will tell you so, too; go to any competent juror and see what he says. I hold, Mr. President, that in the views of the people we have the expression of the voice of God. As long as I live in a free country I shall stick to what I think is right, and I shall stand to what I say, though everything on the face of God's green earth should oppose my convictions.

Dr. Barrett.—We are all laboring for the same common end, but the great difficulty is that we look upon one side of the question only. The colleges are sometimes viewed with suspicion, because the men are not inside of the workings of the institution, and they suppose it is for the express purpose of making money. It should be urged upon the dental boards that which I believe to be true, that they are working conscientiously for the best interests of the profession, that they desire to stand as safeguards against any out-of-the-way proceedings.

Colleges should provide the instruction, and they should be sustained. What should we do without schools? There is no other method. The boards do not afford education. It seems to me that the trouble is here. Too often there are appointed on the college boards men who have received no curriculum of study whatever. They are unacquainted with the methods of education. They have no knowledge of the principles upon which education is founded. Each school has its own method. They all attain the same end. Every instructor has a peculiar method of his own, by which he reaches the end gained. A board that has not gone through any curriculum of study may desire to ascertain how much an applicant knows. They are not acquainted with the methods of education. They simply ask certain questions. The student comes before them after having passed his examinations and pursued his studies some time before. The board, not having passed through the curriculum that he has, is not acquainted with the methods by which that information has been imparted. They ask strictly technical questions. How many of you could answer them? I cannot do

, because it has passed from my mind. Instead of being able to o through with the methods and educe from the student that which e really knows of the principles of practice, they ask questions hich they have committed to memory. That is an injustice. Understand, I do not accuse the boards of doing anything of this ind. It may be the case, however. I believe in the appointment f a national board of examiners. Their duty shall be to examine he State boards and see if they are qualified for their position.

I see I have struck a responsive chord in the heart of almost very one. Say what we will, very frequently these boards themelves have obtained the special legislation through their influence. They have learned the passage of a law which enabled them to sit n judgment upon the schools. That, I believe, is one of the causes f friction. The schools object to being subjected to the criticism nd judgment of men who have not passed through the course of tudy which should qualify other men for such a position. In the rst place, no one questions the honesty of the motives. It is said hey are looking for money,—that they demand a fee for conferring diploma. What of it? In the State of New York they demand fee of thirty dollars for the conferring of every degree. That is n honest charge. They should be compensated for the labor they o; but the point is that they both be made amenable to the same bjection. The amount of it is, we should work together. The ducational boards and the colleges must come together; they must armonize their views, or there will be a disruption. There must e an appeal to the courts, and see whether a dental diploma is ood for anything or not. A mandamus might be asked for, which ould compel a board to show why they should disqualify a student ho holds a diploma from a reputable college. They would have right to such a mandamus and they could obtain it. You see ere are these methods of friction. The boards and dental olleges must be brought into harmony. I believe that the office the college is the more important, because it is the basis of e whole thing in giving the education, which can be obtained no other hands. Is it anything strange that a college which organized for such a purpose should object to having judgment ssed upon it,—a final, irreversible judgment passed by men who, many cases, they think are not qualified to do so? That, I lieve, is the cause of complaint by the colleges. We know that e have colleges conferring degrees where the qualifications of e student are defective, and if such colleges are to be unquesoned and their diplomas are to be acknowledged upon the part

of the community, what would become of our educational law? I believe that the solution might be found to be here: that the boards themselves, who have an important office to fulfil, should examine the methods of teaching. They would thus be enabled to carefully judge of the status of the college, and thereafter recognize the degrees conferred by it.

Now, there is another question. No teaching faculty should confer its diplomas. It is the duty of the teachers to teach, not to grant diplomas. I would have a State board appointed as in the State of New York, before whom should appear the students from all the colleges. Every college should come before it,—medical, dental, literary, or whatever it might be (a different board for each branch of study); before them should appear every student for examination and be found worthy. By this board should be conferred the degrees. Then the schools would devote themselves entirely to teaching, giving their time to the education of youth; all charges of irregularity in the granting of degrees would be removed, and they would no longer be amenable to charges that they are working for money alone.

Dr. Crouse.—Many of the societies did not recognize what we wanted when we sent out our circulars. We desired to get at exactly what literary work they had done, and what progress they had made. I speak on that subject, as it was part of the work of this section. It is in connection with the educational part of this subject.

Subject passed.

PUBLISHING THE PROCEEDINGS.

Dr. Abbott moved that the proceedings be published in the journal of the S. S. White Dental Company, and the committee be instructed to endeavor to make arrangements for the publication upon the same terms as previously existed.

Dr. Truman.—I think it is time, instead of instructing the executive committee to do as has been stated, that this Association should take into consideration the fact that they ought to publish their own proceedings. I do not believe, Mr. Chairman, that this Association should go to different journals and say, "How much will you give for our proceedings?" It is lowering the standard of our profession. What we ought to do would be to appoint a committee to have them published independently, no matter what it costs; and if they must go to a journal, let them be published in those periodicals that work directly for the profession. The time

come, in my estimation, when this profession should show a fessional spirit. It does not show it here, and the fact that this tion was made, that they should be printed in the paper that l pay the highest price for it, is a disgrace to this body. I hope executive committee will do nothing of the kind; but that they l leave it where it has been before, and I do not see any reason y it should not remain there. It was done exceedingly well; if there must be a change, let the proceedings be published by s Association.

Dr. Abbott.—This is all very well, but the journal that published m the last year did so upon the same terms as the other did, l gave us no better circulation. I agree with Dr. Truman that s Association should publish its own proceedings, and should ve them in pamphlet form, one subject after another, as soon as ssible. I say if we cannot do that, let us have the journal that ll give us the greatest circulation. I know nothing of money tters. I do not care about this question, either. I will help my- f to pay for the publication of the proceedings. I want it done once, as soon as possible, and done well.

Dr. Cushing.—I think Dr. Abbott is under a misapprehension in gard to the facts of the case. The proceedings last year were ought out in the smallest time that they ever have been. They re distributed November 4.

Dr. Abbott.—I regret that we get nothing of the proceedings til the bound volume comes to us. We lose sight of nearly erything. We have forgotten many of the minor facts; but if y are presented at once, and we have them with us, it becomes greater interest, and they make more lasting impression upon minds. I do not care if a dozen journals have the proceedings.

Dr. Fillebrown.—In consideration of the exclusive privilege of reports of this Association, I believe the rule to be that the rnal securing the report publishes the transactions. That is the e paid for the privilege. I do not think we get any other con- eration.

The motion was then carried, awarding the proceedings to the S. White Dental Manufacturing Company.

Adjourned.

ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.

The usual routine business having been transacted, the President Dr. Jack, presented the essayist of the evening, Dr. C. N. Peirce who read a paper on "Pyorrhœa Alveolaris due largely to Systemic Predispositions."

(For Dr. Peirce's paper, see page 241.)

The discussion was opened by Dr. Truman: I take issue with Professor Peirce directly as to the origin of Pyorrhœa Alveolaris He lays great stress upon serumal tartar. I am not aware that any one has yet demonstrated absolutely that there is such a deposi from the blood or serum upon the roots. It seems to me to b largely pure theory. We are all familiar with the depositions tha may be made in all parts of the organism, and it is very possibl that it may occur upon the roots of the teeth. I do not antagoniz this supposed fact, but simply affirm that it has not been, in m judgment, demonstrated. Dr. Ingersoll was, I believe, the first t call attention to this tartar and its possible origin, giving it th name. If serumal tartar exists, admitting that it is present upo the roots of the teeth, what is the effect? Dr. Peirce asserts tha it is primary; I entertain the view that it is secondary in it action. If I understand the origin and progress of this disease, begins first by irritation. We find, in its minor manifestation, in flammation around the necks of the teeth, the red line indicatin congestion at the marginal border, with hemorrhage upon th slightest touch.

I regard this as the beginning of this pathological condition this necessarily becomes pyorrhœa by the increased development pathological germs, and these I regard as the primary cause of th disturbance. When the histological conditions that exist aroun the necks of the teeth are considered, there will, I think, be agre ment with me that the evidence is clearly made out that after th irritation is produced at this part, the development or increase development of micro-organisms takes place, and the waste produc produce inflammation of the pericementum. But it is not, in m judgment, that irritation is produced by the deposit named, wheth this be called salivary or serumal tartar. That it is secondar must be clear to any one who has carefully examined the conditi of the pockets formed in this disease, and that irritation of the pe cementum precedes that produced by the calculus present.

And again, I take exception to the fact that the deposit exists in l cases. If this were so, it would seem impossible that we should ave the destructive effect which we know exists. Tartar is found large quantities elsewhere on the teeth, but beyond producing re-orption of the tissues, there is none of the usual phenomena accom-anying pyorrhœa alveolaris. The absence of activity in the germ ement is most noticeable; indeed, I regard the presence there in jurious numbers as an impossibility.

I must also disagree with the essayist as to the age of patients. have had many patients with pyorrhœa that were quite young, ith teeth comparatively soft. It must be admitted that it is rgely a disease of middle age. My own view of the matter is at pyorrhœa is mainly local, and that it may be governed by sys-mic conditions which aggravate it; but if we can cure or relieve e local manifestation, the systemic will take care of themselves, far as this disease is concerned.

The question has been raised in Professor Peirce's paper whether the treatment of pyorrhœa alveolaris we can restore the tissues parated from the cement. It is well known that in the implanta-on of teeth we have reformation of bone around the tooth holding in place. In pyorrhœa, ordinarily the pockets remain, and it be-mes a difficulty as to how these are to be treated in the future, ter we bring about a healthy condition. Nothing but the contin-al use of antiseptics will obviate this, and by their use it may be ssible eventually to have redevelopment of bone. In any event ey must be used, or there will be a recurrence of the disease.

The possibility of infection will depend on the transfer of irrita-on from one tooth to another and the continued development of icro-organisms in the new locality.

I had an interesting example of reformation of bone around teeth bsequent to treatment in this disease the present week. I treated e case over a year ago, and had no expectation that this would satisfactory, as several of the roots were exposed almost the en-e length; but during the intervening time the case was thor-ghly cared for antiseptically, and, when examined, I found that, ith one exception, tissue had formed closely around the margin of e gum, and the teeth were perfectly firm and healthy. This seems show that these pockets can be filled up with osseous tissue.

Dr. Brubaker.—The pathological process alluded to might throw me light upon the change around the tooth. If I understand r. Peirce's position, there is a deposition of some sort of lime in e pericemental membrane, and that this deposition, by its pres-

ence and irritation, is the immediate cause of the flow of pu
Whether the deposition upon the roots is of the same character a
the salivary calculus I do not know. There is just a possibility tha
the deposition, as shown by some of the teeth, is an oxalate of lim
instead of phosphate. The doctor assumes that the deposit of ca
careous scale is a result of either abnormal conditions of the bloo
vessels, or some disorder of the general nutrition.

In urinal troubles it is well known that in the case of childre
of three or four years of age, there is a deposition of oxalate
lime which forms, and, being retained in this locality, it excit
irritation and develops pus; and we may have here then a conditio
of pyorrhœa similar to that around the teeth. This deposition
oxalate of lime might be the result either of changed condition
the blood-vessels or of change in the nutrition, and this depositio
is also hereditary.

The deposition of oxalate, or any salt, in fact, always takes th
line of least resistance. There is the condition which has been d
scribed as an oxalate of lime diathesis, which has many similarities
uric acid diathesis. If you take that condition, it is accumulat
in the body as some disorder of nutrition. In one it is a depositi
around the toe; in another around the joints of the finger a
thumb; deposit in the ears or stomach; or it may be a deposit in th
throat, according to the peculiarities of this or that individu
These may be only analogous to conditions around the teet
and may not be at all similar; notwithstanding, I think it should
looked at from that point of view as being constitutional in chara
ter, and if that particular scale deposit on the teeth is oxalate,
would go very far to prove that it was not local in its origin, b
that it comes from the blood as a result of general disorder of n
trition.

Dr. Peirce.—I would like to say a few words, not in answer
much as to correct a wrong impression. I thought I stated that
wanted my paper to be considered as treating pyorrhœa where
came from a deposition on the root of the tooth, called serumal
sanguinary deposit.

I have three molars in my hand which I have taken out qui
recently, all coated with a hard cement on the end or near the en
of the root, from a mouth where all the teeth have been more
less affected, but these were extracted before the patient came
me, and the deposit is confined to the root of the tooth. It w
simply of that phase of which I wanted to speak in the paper.

I agree with Dr. Truman that where it occurs without t

presence of serumal deposition it commences at the margin of the gum; but where it comes from what has been termed serumal deposit, I am satisfied from my experience the irritation will start at the end of the root without any connection whatever with the cervical border, and from that point it works upward.

Dr. Darby.—First of all, I desire to congratulate the essayist upon the fact that he mentioned the name of Dr. Riggs but once in connection with the disease under consideration. We have better names than "Riggs' disease" for this condition.

I never think of his method of treatment, nor look at the instruments which he designed for the purpose, that I do not shudder, for I consider his method cruel, and in most instances futile.

I think Dr. L. C. Ingersoll was the first to denominate the deposition at the apex and along the side of the root sanguinary calculus. Possibly Dr. Black adheres to a better term when he calls it serumal calculus. It is unquestionably from the blood.

The essayist has spoken of the constitutional and hereditary origin of this disease. I can remember when it was nearly always regarded as a constitutional if not an hereditary one, and I am not sure now that the tendency to such a condition is not of this character. I will not be quoted as having said that because one or both parents have suffered from pyorrhœa alveolaris, their offspring will do so, but there have been so many instances brought to my notice where persons have said to me, my father or my mother lost their teeth in the same manner, that I am sometimes led to believe in this theory.

Professor Truman's experience is in harmony with my own observation, that the disease does not often manifest itself before middle life, and yet I have seen well-defined cases of it long before. I recall this moment a young lady in whom it appeared in a very pronounced form as early as the nineteenth year, and at twenty-six or twenty-eight she had lost all of her inferior teeth except the two wisdom teeth. I saw but yesterday a very marked and sad case of this disease. The lady had been a patient of mine for more than twenty years. Her teeth were unusually good, and she had always bestowed upon them the best of care. She has been spending three or four years in Germany and has just returned to America. My surprise was great when looking into her mouth to find all of the six anterior superior teeth elongated, loose, and pus flowing from the gingival border upon the least pressure. She, too, supposed the disease an hereditary one,—for, said she, my mother lost her teeth in this way when she was about my age.

My observation has been such as to lead me to agree with the essayist in his belief that the disease does not usually begin at the gingivæ, but at some point along the root. I am quite sure that I have seen more cases in which the disease began high up on the root than otherwise. The serumal deposit is, in my opinion, one of the sequences, and not one of the causes, of the inflammation.

Dr. Truman.—Dr. Peirce stated that it was not confined to one tooth. I can give an illustration in my own mouth. Twenty-five years ago I had one tooth that was affected, and treated without any success with chromic acid. I eventually relieved the difficulty, but it never extended to the adjoining teeth.

Dr. Rehfuss.—I have nothing especial to say upon the subject. I think with Dr. Truman that the cause of the disease is not always constitutional in its origin. I can cite in my own practice a number of cases; particularly one in which the disease had progressed and involved three teeth of the lower jaw,—two central incisors and the right lateral. In this case I had the attending physician make a thorough examination of the patient as to constitutional troubles, involving an examination of the urine and the most careful observation otherwise. While I cannot say definitely in this particular instance that it was not due to systemic troubles, still it led me to believe that such was the case. I discovered that there was a serumal deposit, but only half-way down the root; there was none at the neck; the formation of pus naturally followed, and the treatment I found brought about a normal condition of the gums, that proving to me that in this one instance it was one purely of local origin.

As to constitutional causes, a number of our best writers are agreed, as Professor Peirce has stated, that in the majority of cases it is due to urinal troubles. In this line, my investigations have not been as deep, of course, as those of the essayist, but one case in particular I can cite in which the patient had urinal trouble. I can state that it was not positively proven to my mind that the pyorrhœa alveolaris was of constitutional origin, due to this genito-urinal irritability, though there was a serumal deposit on the roots.

It seems to be a vexed and unsettled question in the profession as to whether pyorrhœa alveolaris is of constitutional or local origin. As Dr. Truman stated, constitutional troubles excite or increase the disease.

Dr. Jeffries.—I don't care to discuss the scientific points brought up for consideration. I have a case in mind that I would like to speak of,

illustrating the fact that they are not all middle-aged patients,—one under treatment where each of the anterior lower teeth were, I think, in about the worst condition I ever saw. The gums were very much congested, teeth loose, and an instrument could be passed half-way down the roots. There was a marked depression on the lingual surface. The teeth were forced, by occlusion of the under teeth, probably one-eighth of an inch out of the arch, making it prominent and very unsightly, but by treatment with aromatic sulphuric acid, after removing the calculi, the gum healed very nicely. The right superior central had to be brought into line and held there with a gold band.

Dr. Head.—I desire to inquire of Dr. Peirce if he has ever seen any specimens where these deposits were found upon the teeth and did not appear at the neck? In these two specimens they are extremely interesting; it is true, the larger quantity is well below the margin of the gum, and there is a distinct line from the gum down. As regards the age, fully one-fourth of the cases which I have had have been less than twenty-eight years of age.

Dr. Peirce.—I have a great many cases where they were evidently, in the inception, at the apical end of the root, having no connection with the neck of the tooth. Calcic pericementitis involving at that time the end of the root only, as the exudation increases, it must find some exit, so it works out towards the border. The disease, as it progresses, must find an exit for the exudation at the root, and it finds it easier by working up and out at the gingival border than in any other way.

Dr. Head.—If the germs are found at the neck and at the end of the teeth, is it not difficult to tell where it starts?

Dr. Peirce.—I have seen many specimens where I know the commencement of this disease was at the end of the root. In its progress it made its way up to the gum-line.

Dr. McQuillan.—I would like the gentlemen present to tell their success in treatment. I consider I have bridled it to a considerable extent, but never made a cure of it; and after working as conscientiously as I know how and getting the mouths in fairly good condition, I find they come back in six months or a year, and then there is a slight recurrence of it, but I would like to know whether those present have had many cures. It always seems to me that a case of pyorrhœa means a continuous fee for the dentist. I always try to be very careful and keep up the treatment; not with that end in view, however, but to help the patient.

Dr. Neal.—I have a patient forty years of age, who I know or believe is perfectly healthy, but the right central is much affected with pyorrhœa alveolaris; the lateral is loose and projecting, and the adjoining tooth is also affected on the right anterior surface, and in each case the disease is confined only to one portion of the tooth. Pus issues from the gum. I treated it with disinfectants, and particularly phenol. I think the phenol has been of great advantage, better than hydrogen peroxide; but I am not able to cure it. The patient has been coming to me for a year or two. I am at a loss to know what to do or how to proceed. He is a man very careful, and would not lose a tooth for a great deal of money. I told him I could possibly succeed in getting the gum to unite with the tooth where it has receded. Am I correct?

Dr. Deane.—I am very glad there are so many here to-night who can help me out on this question. I entertained the idea a few years ago that I could cure a very difficult case, but I found the patient was worse off after treatment than before. He told me his mother had lost her teeth before she was thirty. All his teeth, without exception, are affected. He does not come as regularly as I would like to see him, and when he does, pretty nearly every tooth is bathed in pus. I have succeeded in keeping them in by using peroxide of hydrogen and iodine. I wash them out as well as I can and then inject iodine with a Lewis syringe, and in that way have been able to keep the teeth in his mouth, but they are not of much value to him.

Dr. Peirce.—I felt when I read the paper it would be very difficult to discriminate between irritation commencing at the gingival border and that at the end or side of the root; I wanted to discriminate between the two, and wanted my paper to apply to but one only. There is a different condition, though yielding probably to similar treatment; in both, pus and bacteria are present.

Now, so far as treatment is concerned, if I give you one typical case it will cover the ground.

About three months ago a physician in the neighborhood came to me. He is about forty-three years of age, and on looking at his mouth I was, to say the least, surprised. There was not a tooth from which there was not exuding pus, and he had thirty-two. I handed him a tumbler with a little peroxide of hydrogen, and asked him to rinse out his mouth. He washed it out repeatedly until he had it quite clean. I made an appointment for him a few days later, when I could give each tooth attention. He came at the appointed hour, and I took my scalers and went regu

larly around the mouth, removing the tartar as well as I could, and then applied to the gums some aristol rubbed up with gaultheria. I put it down in the pockets with a little spatula I had made from a small excavator which I had flattened at the end, so I could work it to the bottom of each pocket, and then painted the gums externally around the mouth with tincture of iodine. He wished me to see his mother; that she was seventy-five or seventy-six years of age, and was affected in the same way. She came in the course of a few days. The gentleman came back by appointment in about ten days, and I then repeated the treatment,—very similar to the first,—washing out each pocket with peroxide of hydrogen and then washing the mouth, to clear it of pus, and made an application in the same way with the gaultheria and aristol. Of course, on the second visit the gums were in very much better condition, as they had healed. The application of the remedy was successful in reducing irritation. I have had five visits from him at this time, and all his teeth have improved perceptibly; and though in better condition than they were, I cannot encourage him that his mouth will ever get well, yet I informed him that if he will keep the teeth under treatment for years, I have no doubt they will be saved, but only by constant care; to let them go five or six months without attention would be destructive to them.

The mother came in by appointment. She had lost two molars of the right side, inferior and superior, and one on the left; the remaining were somewhat loose, the bicuspids were quite loose, and the anterior teeth all had little pockets. I treated her the second time; her mouth is in a much improved condition. I never saw a more rapid and marked change in the mouth of any one. The two first molars are the only ones I fear losing. The others have healed, and while the pockets are there, there is no exudation; but I told her she will have to come every two months, as that is the only way she can keep them.

There was a little tendency in the son to salivary deposit, but the free use of oranges abated it; but on the necks of the teeth there was irritation on the cementum on nearly every tooth, but whether that was due to the frequent use of oranges I could not say. It may have been only a concomitant and not the result. When he first visited me his teeth had given him considerable pain, but after the first treatment he had none.

In speaking of gaultheria and aristol, I have a preparation that I like, because I can make up a quantity of it and have it for use.

I take the aristol in a wide-mouthed bottle and put in equal quantities of tincture of iodine, oil of gaultheria, oil of cinnamon, and carbolic acid. It has an advantage over gaultheria and aristol. It is not gummy; the iodine cuts it and makes it creamy, so that it can be readily used, and it remains without change for days or weeks. I like the preparation, and have used it for some time.

Dr. Luckie asked what would be the result of a patient using Buffalo lithia water, stating that he had been asked the question by a patient, and he replied that he did not know.

Dr. Darby.—I do not think my method of treatment is unlike that of many others. I have been using of late, with much satisfaction, "Dr. Robinson's remedy," which consists of carbolic acid and caustic potash, and after the manner suggested by the gentleman whose name the remedy bears. It is simply to remove as much of the deposit as possible, and then pack into the pockets cotton saturated with this remedy. I have seen some wonderful changes brought about in a few days by one or two applications made as above indicated. I leave the cotton in the pockets as long as it will remain, which is usually two or three days.

Dr. Deane.—In speaking of instruments, I would like to suggest that the ordinary quill tooth-pick can be satisfactorily used by splitting off half an inch of it and inserting it in an ordinary nerve-broach carrier. With it you can carry medicine up the side of the tooth nicely. It goes almost up to the apex, because you can shave it down and use a pumping motion, which carries the remedy up the side of the tooth by capillary attraction; after using it can be thrown aside and another made.

Dr. Luckie.—I would ask what effect the destruction of the pulp would have? Dr. Peirce has spoken of the dentine filling up during the progress of the disease, and I would be pleased to know if devitalization of the pulp would have any effect in changing nutrition from the pulp, if it was diverted to the peridental membrane. I am treating a case where I intend to fasten all the teeth together. There has been considerable abrasion of the teeth, and the cusps of the bicuspids are entirely worn away; the remaining teeth it is my intention to devitalize. I would ask to have the opinion of the doctor on that method of treatment.

Dr. Peirce.—I remember Dr. Garretson coming to me some ten years ago and saying his method of treating it was to devitalize the tooth; he then made some further experiments, and a few months later reported that he had not had the satisfaction he had anticipated from this method. I don't know of any other one who ever

ried it. That is all I know of the matter. I never attempted it myself, but don't think it would be beneficial.

Dr. McQuillan.—The worst case I have had in my practice is one that has been in my hands for fifteen years, and my father's for twenty-five. I have seen the patient every six months. About five years ago there were signs of pyorrhœa, and it has been very difficult to save the tooth; the disease has progressed rapidly.

I have used Dr. Robertson's remedy as mentioned by Dr. Darby, and have found most gratifying results from it; and also where I have an intelligent patient I also give them a preparation of chloride of zinc, six or eight grains to an ounce of rose-water, and tell them to paint the gums with a camel's-hair pencil once or twice a week. I have found considerable benefit in that direction.

Dr. Jack.—I have little that will add to what has already been said. I would speak of one case where I tried successfully to retain the teeth, where the disease had occasioned but slight separation of the softer tissues. We may be able to preserve them for a considerable length of time, and yet where deeper pockets have occurred, in consequence of the longer-continued disease, the obstacle in the way of amelioration would appear to my mind to be due to the fact that it is impossible to produce a state of permanent cleanliness in the pockets, they being filled with the *débris* of substances in mastication, and also by exudations that cannot by any means escape.

Dr. Rehfuss.—My method of treatment does not differ possibly with that of other practitioners. I first remove all deposits, if there be any, on the roots of the teeth, and wash them out, using permanganate of potash or hydrogen peroxide to get rid of all pus, and then I have recourse to massage, possibly after my second treatment. I use three forms of massage; following this I use a paste of aristol or iodoform or iodol,—either one of the three in connection with oil of cassia,—and place it in the pus pockets. I find massage treatment very beneficial, but it must be very gentle at first.

I wish to say that Dr. Mills, of New York, has experimented with massage in pyorrhœa alveolaris since I first brought out my papers on the subject, and he claims he has much better success than he did before using it.

On motion of Dr. McQuillan, the thanks of the Society were extended to Dr. Peirce.

Adjourned.

CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY.

The President.—Gentlemen, allow me to introduce the speaker of the evening, Dr. Ottolengui, of New York, who will give us a paper entitled "Pulp-Stones."

(For Dr. Ottolengui's paper, see page 248.)

The President.—The paper is now open for discussion.

Dr. Mills.—I think this society ought to congratulate itself on having such an able paper read before it.

Dr. Ottolengui has given us the results of his own observations. We are beginning to realize that we are specialists. Such a paper shows the value of scientific research.

Dr. Watkins.—The matter of "pulp-stones" has been of considerable interest to me of late.

When I was in Boston attending the Union Meeting last October, I heard a very interesting paper read by Dr. Cook, showing the formations which Dr. Ottolengui has so ably described. A great many of them were the regular pulp-stones, and others were produced by granulations forming on the sides of the pulp-canals. . . . The gentleman who read the paper above alluded to, stated that he had examined over five thousand pulps, and more than forty per cent. of them had some form of calcification. I never looked for pulp-stones before, consequently saw but few. Since then I have found many of the formations which Dr. Ottolengui has mentioned.

I want to emphasize the fact that the treatment of pulps with arsenic, wherever there are pulp-stones, has a tendency to create inflammation, and cause almost unbearable pain.

I remember one case where I treated a lady twenty-eight years of age. I cleaned out the cavity and put in arsenic, but the pain was so severe that I was compelled to remove the arsenic and put in an anodyne. I did this several times, and each time that I applied the arsenic there was great suffering.

After several efforts I succeeded in exposing the pulp and destroying it, but not without a great deal of discomfort to the patient. I removed the pulp, and several pulp-stones with it. After the canals were cleansed, and filled with a temporary filling, there was no pain at all. At length this filling was removed, and the canals were filled with gutta-percha, when the pain started again. The patient suffered intensely. I removed the gutta-percha, and

ıe pain disappeared. I again filled with gutta-percha, and the ain returned. Finally, I suggested to the patient that I remove ıe tooth. I then cleansed the canals and filled them perfectly to ıe ends, and removed the ends of the roots which were exostosed, ıen replanted the tooth. There was a certain amount of irrita- on, and it continued perhaps three months, but since then—it is ow about six months, I think—there has been no return of pain, nd the tooth appears to be very solid in the jaw.

Dr. Sanger.—Some points about this paper are new to me, and, oubtless, to many of us. The subject of pulp-stones and their de- italization is a matter of great interest; the existence of pulp- ones where there is no apparent exposure; where the dentine is apparently good condition; where no disease is indicated.

Now, in my own practice, when a patient comes to me with a ulp exposed I do not use arsenic. But in order to devitalize when ulp-stones are present, arsenic is not a prompt and effective agent ccording to this paper; that is, as I understand it. Now, how are ve going to determine when we are to use the arsenic?

Dr. Luckey.—There is not much that I have to say on this sub- ect, and find only one or two points as to the correctness of his ork, and the question of policy as to when and how to use arsenic.

In most of the cases that Dr. Ottolengui has given us, his patient eturned after two or three hours of intense suffering, caused by he inflammation arising from the use of arsenic. I think that if e had used the preparation of arsenic at the latter end of the day nstead of in the morning, the patient would not have suffered less, ut he would have been less annoyed. His mistake was in putting in in the morning instead of in the afternoon. If, instead of a ombination, he had used a chemically pure preparation of arsenic, is patient would probably have had a hard night, but in the morn- ıg, pulp-stones or no pulp-stones, he would have found his patient great deal better.

Dr. Watkins.—If Dr. Luckey were to leave the arsenic in his atient's tooth for forty-eight hours, he would find him still suffer- ıg at the end of that time.

Dr. Evans.—I would ask if it is necessary to destroy the pulp there is no pulpitis indicated? When we know that pulp-stones re producing pulpitis, then the case would call for its destruction. hy is it that arsenic causes pain when the pulp is not exposed, nd it does not cause it when it is exposed? When a tooth is ex- mined and it is determined it has pulp-stones, what then should ıe dentist do? If he applies arsenic, he increases the irritation

and produces a condition of thrombosis. When a pulp is not exposed, it is confined in a cavity where it cannot expand, the blood-vessels become enlarged, and every pulsation of the heart is felt in that cavity. When a pulp is exposed and arsenic is applied, it is instantly absorbed and devitalization ensues. When you aim to destroy a pulp, and there is a condition of pulpitis, the best thing to do with it is to expose and rupture it; the bleeding will afford relief, and your arsenic will be immediately absorbed. But if I found a person using arsenic on an unexposed pulp in a state of inflammation, I should condemn the treatment. Dr. Watkins says if you apply arsenic to a pulp inflammation will follow. I heard the paper of Dr. Cook, of Boston, in relation to this subject of pulp-stones, and I was surprised to find that such a large percentage was found.

It is degeneration of the pulp that causes pulp-stones. It is a condition of calcification that is slowly progressive. No pulp can be capped that is exposed and the lining membrane is ruptured, as the odontoblasts at that point are atrophied and means of calcification lost.

Dr. Luckey.—Every gentlemen here knows that it is important to apply arsenic with discretion. If you apply it once, you may take it out as soon as you please, but your result will be the same,—you will have a destroyed pulp.

I have practised dentistry pretty nearly twenty years, and I do not know of any remedy that has given me more satisfaction than arsenic, and I do not know of more than two or three cases that have been in any way unfavorable in their results in which the arsenic has not done its work, pulp-stones or no pulp-stones.

Dr. Meeker.—I suppose a good many of my friends here know that I have always been opposed to the use of arsenic. I have not used it, nor have I even had a particle of it in my office for the past five years. There are only two cases of pulps that I can remember of having destroyed by the application of either chloroform or cocaine within a year.

I go to the meetings and I hear what dentists have to say about the use of arsenic. Possibly I do spend a little more time by my methods, but I don't destroy pulps if there be any possibility of saving them. I do not care how long I am doing my work, so long as the patient is able to stand it.

Where there are cases of pulp-stones, I have never saved a pulp.

Dr. Mills.—I do not suppose I have applied arsenic five times in

year, yet I want to say that if it is used intelligently and with scrimination, it is of advantage in superficial decay.

I have a tooth of my own that was treated with arsenic by Dr. Wm. H. Allen. When I went to him for advice, he said, "If you want a good, substantial tooth [my teeth are dense and very well organized], there will be no danger in my using arsenic." He made ne application, and a few hours afterwards he removed the softened ortion and polished. That tooth is here for any man to see, and is live.

At the Dental Convention in Saratoga, some years since, this ubject was discussed, and among other things it was said, that if a an understands the intelligent use of arsenic, there are circumtances in which it can be safely applied. I do not speak of this as n advocate of the common use of this agent, but only of its imited application. I am perfectly willing to accord to every nan the right to his own opinion, and I am also willing to stand n my own record. Dr. Meeker made a statement in opposition to he use of arsenic which was just as dogmatic as mine, and both an be true. I claim that the pulp in my mouth that was exposed nd was treated with arsenic is alive. My statement has been corroborated by such men as Dr. Atkinson and others who have been n practice fifty years.

Dr. Ottolengui.—I think it must be fifty years since Dr. Atkinon used arsenic for that purpose.

Dr. Mills.—I do not think it is courtesy to doubt my statement. am, as I have already said, perfectly willing to stand on my ecord.

Dr. Watkins.—I first want to say that I hope every young man resent was asleep when Dr. Mills made his statement, for I am fraid it may have a bad effect, and some one may go on and use rsenic. I hope they will not. I think the time has gone by for its se for the purpose of destroying sensitive dentine.

Dr. Ottolengui.—I do not think that the use of arsenic is ever an dvantage, and I think the dentist who uses it will live to regret it. low any one can get up and say openly, in the presence of young en, that arsenic is ever excusable in a tooth that is sensitive, I nnot understand. If you would seek authority for such usage, you ould have to go back to the practice of fifty years ago.

Now, this is the idea I wish to impress upon you,—persistent in; pain that you cannot stop means pulp-stones, and it means it ways. There is no question about it.

Editorial.

IS DENTISTRY A FINANCIAL SUCCESS?

THE inquiry, Is dentistry a paying profession? seems to be agitating some of our dental societies; and, as faithful exponents of the current thought, it is our duty to meet this question, not, perhaps, that additional light may be thrown upon it, but that it may receive the general consideration the importance of the subject demands.

The rapid increase in the number of young men entering dentistry has naturally led to the pessimistic feeling that the flood is upon us, and we are doomed to an overflow, not only of incompetency, but a bitter competition that eventually must so level practice that the financial rewards will be universally unequal to holding the profession of dentistry to a social equality with other callings.

Dr. Crouse, at a meeting of the Chicago Club, said, in regard to this subject, "It is not a good paying business, and a man who has ability enough to do something else and knows it, won't go into it. I have not induced any one in the last twenty years to take it up as a life-time work."

Dr. A. W. Harlan added, "Probably there is not a man here who earns twenty-five thousand dollars a year, and I feel sure if I were practising as a lawyer that I would earn double that. . . . I do not believe there is a man in the room that ever did earn twenty-five thousand dollars a year, but I know of an eminent surgeon in this city who made seventy-five thousand dollars in one year. . . . There are too many mediocre intellects engaged in this occupation. And if men are content to live along on incomes of two thousand a year, or three thousand a year, and our profession is filled up with that kind of men, it is very hard for those who have high ideals to reach a high standard."

Dr. Allport followed with the statement,—"Dr. Harlan says there are very few of the dentists in our city doing a business of twenty-five thousand dollars per year, and many not over two thousand dollars. This estimate is too high, and I challenge any one to show that out of nearly seven hundred dentists in Chicago we have five who are doing a business of over fifteen thousand dollars per year, and that there are ten more who are doing a

business of over ten thousand dollars, or twenty who are doing over five thousand dollars a year, while there are large numbers whose net income will not reach one thousand dollars."

These remarks from men of large experience in dental practice in a city supposed to yield the richest returns of any other outside, possibly, of New York, read strangely. To find these men sounding the note of alarm, and also placing themselves in the confessional and acknowledging that dentistry is a non-remunerative calling, is startling; that, notwithstanding the increased intelligence in a sanitary direction, the people will not pay the dentist as they pay, willingly or unwillingly, the doctor or lawyer.

While the main facts of these different statements are probably true, not only of Chicago but of the entire country, we might even go further and doubt whether any man ever succeeded in accumulating from his practice *alone* one hundred thousand dollars. This statement has, of course, no reliable data to sustain it; but experience leads to this conclusion, for of all the dentists who have left comparatively large estates, there have been other avenues for the wealth accumulated besides that of the daily work over the chair.

While it is true that the same amount of energy and active thought given to another line of work may show more brilliant results in individual cases, it does not by any means demonstrate, taking an equal number of men, or the entire body of dentists in the United States, and scattering them throughout all the avenues of active life, that the success would be any greater.

The wealth of the world has always been centred in the hands of the few, and, as was well remarked by Dr. Hartt in that same discussion, "We will have to go back farther than the dental colleges; . . . the poor man is getting poorer every day and the rich are getting richer." This is the rule of all centralization. It applies to power as well as money. Royalty and nobility mean the loss of freedom to the masses, and the accumulation of money in the hands of the few means, by the same law, poverty for the millions. It is not a law applicable to dentistry alone, but applies with equal force to the entire social fabric.

It is probably true that the emoluments of dental practice, outside of our large cities, will not average two thousand dollars a year, but those who have had experience in country practice will accord with the statement that but few in the ordinary branches of trade exceed this in the same locality. The laws of demand and supply apply equally to all classes and affect all alike.

The assertion that dentistry is becoming overcrowded is proba-

bly correct, and the usual charge is made that the colleges are exerting all the means in their power to draw young men into a study which can only end disastrously to them. While this may be also true of a few of these institutions, it is certainly not of those with which we are familiar, and we question the accuracy of the statement. As far as observation goes, the same effort is put forth that all medical colleges and institutions of learning make,—that of annual announcements and proper advertisements. Beyond this no well-regulated school would attempt to go.

The explanation of this rush for dentistry has a deeper explanation than that offered. It lies in the fact that large numbers of young men are reaching maturity in this country with no training beyond that the high school or college has afforded. With limited means they are called to meet face to face the struggle for bread. They may or may not be fitted by nature for commerce, or for occupations requiring mechanical tastes; this has yet to be tested in the marts and the shops of the world. The largest proportion look to the professions. The comparative advantages of medicine, law, theology, and dentistry are carefully weighed by parents and guardians, and a certain proportion go to each without much regard, it is feared, to fitness for either. The increasing number drawn to the latter is easily accounted for, from the fact that medicine and law are supposed to be overcrowded and slow to prove self-supporting.

Admitting all this, can that profession be considered non-remunerative which furnishes a good living to every man who will faithfully follow it? It is questionable whether more than this, or as much, can be said of any calling. Time alone will bring about a proper equilibrium between population and demand, but as yet the supply of young dentists hardly keeps pace with the growing needs, caused equally by enlargement of population as well as increased intelligence among the people.

The question may be asked, "What is success in life?" Is it to be counted at the close by the number of dollars stored away in investments? Is the record best made in the surrounding of one's self with luxuries? Is that life most to be commended that has been immured in an office, gathering the labors of other men for selfish purposes and giving nothing out? Is the largest bank account the best passport to a life eternal? These and many more questions of similar import might be propounded, and the right thinker would be forced to answer *no* to each.

The noble life is the one satisfied with a sufficiency to meet al

ordinary wants. The true scientist, the teacher, the man who would rather build one stone upon another that the world may be a step higher when he leaves it, marks a success that the millionaires of the hour can never reach. Wealth melts before the rising sun of every recurring day and leaves no trace. The services in the sanctuaries of science mark epochs, and the impression is never effaced. Special arts may be lost, but the currents of civilization find their way always to new regions and new peoples. We build to-day upon the past, and upon its wealth of thought create new ideas, new combinations. This is true success, and finds its application in all the relations of life.

Obituary.

RESOLUTIONS OF RESPECT TO DR. CHARLES A. KINGSBURY.

The following resolutions were passed at the last meeting of the Board of Directors of the Philadelphia County Dental Society:

Whereas, It has pleased our Heavenly Father to call to rest Dr. Charles A. Kingsbury, our friend, associate, active member, and one of the founders of this Society, therefore, be it

Resolved, That we desire to express our high esteem for one whose faithful and earnest work is widely known throughout the profession, and

Resolved, That this record of our deep regret be entered upon the minutes of this Society, and a copy of these resolutions be sent to the dental journals for publication.

L. Ashley Faught,
Secretary.

DR. JOHN ALLEN.

The death of Dr. John Allen, on March 8, in his eighty-second year, marks the passing away from earth of one who has left a positive impression on the dental profession. His record belongs mainly to the past, but its tracings are part of the history of dentistry.

Dr. Allen was born in Broome County, N. Y., November 4, 1810.

He was a descendant of Ethan Allen, of Vermont, famous in Revolutionary annals. He became the student of Dr. James Harris, in Ohio, at the age of nineteen. At the close of his pupilage he commenced his professional career in Cincinnati in 1830.

He secured a knowledge of the manufacture of porcelain teeth, and thus laid the foundation for his success in the production of what was subsequently known as "continuous gum."

This was his most important contribution to dentistry. Others had preceded him in this investigation, but he gave the first practical formula, and cleared away many of the difficulties incident to all new inventions.

He began this work in 1846–47, and filed a caveat in the Patent Office in 1851. This was for a "fusible cement of which an artificial gum is formed applicable to artificial teeth, and by means of which they are set."

He exhibited specimens of this at the American Society of Dental Surgeons. In 1851 a patent was issued, and subsequently the contest between himself and Dr. William Hunter began, to prove priority of invention. This excited intense interest in the dental profession, and until it was settled, in 1855, by compromise, was a disturbing element.

The American Society of Dental Surgeons awarded him a gold medal in 1845, "for his invention for restoring the contour of the face."

The controversy with Dr. Hunter was one of the earliest of the patent contentions, and was practically the basis of the subsequent opposition to dental patents, culminating in the present Dental Protective Association.

The difficulties attending the introduction of continuous gum, and its original imperfect character, made its use very limited; but Dr. Allen persevered, and so far perfected it, through the introduction of platinum as a base, that it eventually became, in the estimation of many, the most satisfactory and artistic of all artificial dentures.

Dr. Allen filled a professorship for several years in the Ohio College of Dental Surgery. This he resigned on his removal to New York City in 1853.

He was interested in the establishment of the New York College of Dentistry, and remained a member of the Board of Trustees up to the time of his death.

In former years he took an active part in the proceedings of the different dental societies, rarely being absent from the sessions

of the American Dental Convention and American Dental Association. It was mainly through the efforts of the late Dr. Ambler, of New York, and Dr. Allen that the American Dental Convention continued its moribund career after the formation of the American Dental Association. On the death of the former it ceased to exist as an organization.

Friday, February 19, he performed his last operation in dentistry. Going home that evening, he complained of not feeling well, and from that time he grew gradually weaker until his death.

His funeral took place at his residence, Plainfield, N. J., March 10, 1892.

Bibliography.

A Short Manual of Analytical Chemistry, Qualitative and Quantitative—Inorganic and Organic. By John Muter, M.A., Ph.D., etc., Analyst to the Metropolitan Asylums Board, etc. Edited by Claude C. Hamilton, M.D., Ph.G., Professor of Analytical Chemistry in the University Medical College, Kansas City. Philadelphia: P. Blakiston, Son & Co., 1891.

The reviser of this book states in his preface "that it has been his effort to let the original text remain as little altered as circumstances would admit." It is unfortunate that the reviser adopted this course, for perhaps there is no book on science in the English language which has passed through four editions and still contains so many inaccuracies and such clumsily-worded sentences as this book of Muter's. Here and there throughout the book abbreviations are used which certainly must be puzzling to the student. For instance, on page 62 the abbreviation HAc is used. Few beginners in qualitative analysis would understand that it signified acetic acid, for in the special tests for that acid on page 47 no reference is made to such an abbreviation. Again, on page 69, few students would understand that S.V.R. signified ordinary alcohol (spiritus vini rectificatus).

On page 12, under Lead, it is stated that in practising upon a solution of Pb $(C_2H_3O_2)_2$, "NH_4HO causes a *white* precipitate of a *white* basic nitrate—Pb (NO_3HO)." It would be interesting to know

the author's explanation of the production of a nitrate from an acetate and a hydrate. Such statements are inexplicable in a book that has passed through four editions, and has finally been revised and now appears practically in its fifth edition.

Notwithstanding these blemishes, the book possesses much that is good. The table for the detection of the metal in a solution containing one base only is an admirable one. The tables for the detection of metals in complex mixtures, barring the obscurity in statement and brevity in description, which latter, of course, is almost a necessity in the construction of such tables, are good.

The scheme for the detection of acids is one of the best features of the book.

The other chapters on organic analysis, water analysis, etc., are in the main good, with the exception of the chapter on urine analysis, which is sufficiently brief to render it almost useless. The plates accompanying this chapter, in which the microscopic appearances of urinary sediments are pictured, are ludicrous in their atrociousness. B.

CATCHING'S COMPENDIUM OF PRACTICAL DENTISTRY FOR 1891. By B. H. Catching, D.D.S., Editor and Publisher, Atlanta, Ga.

The second issue of this valuable work of reference is before us for 1891. It is gratifying to note that the indefatigable editor has improved on the first volume and has removed some of the objections apparent in that of 1890. If this work is continued from year to year it will be invaluable, not only to the busy practitioner, but to the writers of papers, who will be saved many hours of tedious labor in hunting for necessary facts.

The labor of condensation here exhibited has been great, and will, we fear, hardly be appreciated by the general reader. It must be said that, upon the whole, it has been well done. Each paragraph has the name of the journal from which the selection has been made, with the month of issue.

The subjects are classified under Operative Dentistry, Prosthetic Dentistry, Crown-, Bridge-, and Inlay-Work, Orthodontia, Dental Medicine, Oral Surgery, Miscellaneous, Synopsis of State Laws, List of Dental Journals of the World, together with Books and Pamphlets pertaining to Dentistry published during the year, making a book of two hundred and forty-one pages.

We find one line on page twenty-three for which the editor is responsible, and which, embalmed in the pages of a book supposed to represent the best thought of the year, seems out of place.

Dr. Catching says: "Sensitive Dentine.—Chloride of zinc is still one of the best remedies." In view of all the facts, this statement appears to be misleading, and may be the means of doing much harm.

Notice is especially made to this from the fact that a recent paragraph has called attention to the value of oxychloride of zinc for the same purpose. These views have probably been stimulated by the idea promulgated by a prominent writer that coagulation of albumen means a cessation of the destructive effect of the escharotic. No greater error, in our judgment, has ever been sought to be established. Chloride of zinc, from its great affinity for moisture, will continue the coagulation of albumen until it is thoroughly satisfied, whether this be in the tubuli or pulp-canals. Simple experiments with egg albumen will macroscopically demonstrate this, and the microscope will establish the fact for the smaller conduits in dentine. This being true, nothing worse could be placed in a cavity for a reduction of sensitive tissue, for sooner or later devitalization of the pulp is almost sure to follow.

We hope for an extended sale for this book, that the editor and publisher may be encouraged to continue it from year to year.

Manual of Instruction on Hard Soldering. By Harvey Rowell. E. & F. N. Spon & Co., New York and London. 1891.

The value of a book properly prepared on soldering of metals must depend on its meeting the needs of all classes of workers. This is a small work of fifty-four pages, but it covers much of great practical value.

Dentistry needs, just at this time, a book upon this subject. The long interregnum between the period of metal bases and that of ridge-work gave a class of men with little or no knowledge of metal-work or the experience so necessary to make good soldering. The result is that many are incapable of making even a gold crown properly.

The rules given in this book satisfactorily meet the requirements of small work, but will not aid the dentist in more complicated cases. This kind of soldering is peculiar to our profession and demands special instruction.

If this book should reach a second edition, we would advise the author to secure the services of a practical man to prepare this, in addition to that already given. This done, it would be a book necessary for every dentist. As it is, it will be found an exceedingly useful companion in the daily work of the laboratory.

LIPPINCOTT's for April opens with a novel by Rose Nouchette Carey entitled "But Men Must Work." A chatty article by Melville Phillips is "The Literary Editor." "Nihilism and the Famine," by the Countess Norraikow, is a very timely paper and an exceedingly interesting account of the men and women prominent in this, the most remarkable effort for political freedom witnessed in the present century. The portraits given of the principal actors in the Nihilistic movement add greatly to the interest of the article.

The number contains other valuable contributions, and fully maintains its high character.

Current News.

DENTAL SOCIETY OF THE STATE OF NEW YORK.

PRELIMINARY NOTICE.

THE Dental Society of the State of New York will hold its twenty-fourth annual meeting at Albany, Wednesday and Thursday, May 11 and 12, 1892.

Papers will be read by the following distinguished members of our profession: Edwin T. Darby, D.D.S., Philadelphia, Pa.; Eugene S. Talbot, D.D.S., Chicago, Ill.; C. F. W. Bödecker, D.D.S. New York City, N. Y.; Albert Carter Westlake, D.D.S., Elizabeth, N. J.; and discussed by prominent dentists from all parts of the United States. In order that the discussions may be interesting, all those who have been invited to open discussions will be allowed fifteen minutes, others ten.

Nothing will be left undone to promote the interests of practical and scientific dentistry.

NO CLINICS. NO EXHIBITS.

Please set aside the above time and do your share to advance the status of dentistry in the Empire State.

W. W. WALKER, *President.*

C. S. BUTLER, *Secretary,*
67 WEST UNITY STREET,

CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY.

At the meeting of the Central Dental Association of Northern New Jersey, held February 15, 1892, the following officers were elected:

President, Dr. Harvey Iredell, New Brunswick; Vice-President, Dr. R. M. Sanger, East Orange; Secretary, Dr. W. L. Fish, Newark; Treasurer, Dr. C. A. Meeker, Newark.

Executive Committee.—Dr. S. C. G. Watkins, Chairman, Montclair; Dr. George E. Adams, South Orange; Dr. F. C. Barlow, Jersey City; Dr. B. F. Luckey, of Patterson; Dr. Oscar Adelberg, Elizabeth.

Respectfully,

S. S. Hawley,
Secretary.

HARVARD ODONTOLOGICAL SOCIETY.

The Fourteenth Annual Meeting and banquet of the Harvard Odontological Society, held at Young's Hotel, Boston, February 27, was one of unusual interest, owing in great measure to the number of distinguished gentlemen present as guests, and to the encouraging report of the chairman of the committee on the Harvard Dental School upon the matter of raising one hundred thousand dollars, the amount of money desired for the erection of a new hospital and school-building. Among the guests of the evening were Hon. Oliver Ames, Ex-Governor of Massachusetts; Henry P. Bowditch, M.D., Dean of the Medical School; Professor George A. Littlefield, A.B., Principal State Normal School, Rhode Island; Rev. David B. Hutten, D.D., of Boston; Thomas H. Chandler, D.M.D., Dean of the Dental School; Thomas Fillebrown, D.M.D., Professor of Operative Dentistry; Messrs. Albert A. Gleason, Fred. A. Stanley, of New Bedford; Babson S. Ladd, Esq., Dr. Nathaniel Greene, Dr. F. S. Saxon, Dr. V. C. Pond, Dr. S. A. Hopkins, and Dr. William Y. Allen, of Boston. Among those who were expected to be present, and from whom letters of regret were read, were Charles W. Eliot, LL.D., President of Harvard University; Clarence W. Barrow, Manager Boston News Bureau; Nathaniel S. Shaler, S.D., Professor of Geology, Harvard University; Francis A. Harris, A.B., M.D., State Medical Examiner, Massachusetts.

Previous to the banquet the annual reports were read and accepted, all of which showed the society to be in a most active and flourishing condition.

The following named gentleman were elected to serve the Society for the ensuing year:

President, Jere. E. Stanton, M.D., D.M,D., Boston; Recording Secretary, Waldo E. Boardman, D.M.D., Boston; Corresponding Secretary, Charles H. Taft, A.B., D.M.D., Cambridge; Treasurer, Dwight M. Clapp, D.M.D., Boston; Editor, Henry L. Upham, D.M.D., Boston.

Executive Committee.—Waldo E. Boardman, D.M.D., Boston; W. E. Page, D.M.D., Boston; Henry M. Clifford, D.M.D., Boston.

Dr. Eugene H. Smith was chosen to deliver the address at the next annual meeting.

When cigars had been lighted, and both members and guests had settled back to enjoy the intellectual feast to follow, President Stanton rapped to order, and in a few well-chosen words extended to the guests, on behalf of the Society, a hearty welcome and cordial appreciation of their interest in the Society as made manifest by their presence.

He then introduced Dr. Henry W. Gillette, of Newport, R. I., as the orator of the evening, whose address was a most thoughtful and scholarly effort, and which was listened to with marked attention by all present.

Dr. Dwight M. Clapp was then called upon for a brief report of the joint committee on the School and of the Faculty, as to the plans proposed for the raising of the necessary funds for the new building. He stated that a circular letter had been sent to every graduate of the Dental School, outlining the present and future needs of the school, which its growth, both as to number of students and patients, made necessary the taking of some immediate action.

The building now occupied by the school is the one formerly used by the Medical School, and in many respects is entirely unsuited for its present purposes; and instead of laying out money on the present building, which would be an unwise financial investment, inasmuch as it would still remain the property of the Medical School, it has been thought best to erect an entirely new building providing the necessary funds can be raised.

Before calling upon the general public to assist in the undertaking, it is first proposed to ask the alumni for five thousand dollars ($5000), each alumnus to contribute such sum as he can afford; the same to be payable within sixty days to the treasurer of the university as soon as the sum of fifty thousand dollars ($50,000) shall have been raised or subscribed. A copy of the architect's design

of the proposed new building had also been enclosed in the letter to each graduate.

The interest of the alumni in the matter was manifested in the subscriptions which have already been received within the last ten days, amounting to thirteen hundred dollars.

Through the generosity of an anonymous friend, who has within the past two years given different sums amounting in all to thirteen thousand dollars, the school now has, with its other funds, a balance of nearly twenty-one thousand dollars ($21,000) in its treasury.

The speeches which followed Dr. Clapp's report were replete with wit and wisdom, and the meeting at a late hour adjourned with that feeling of encouragement and enthusiasm which good-fellowship and loyalty to Harvard, and all that concerns her welfare, never fails to inspire in the hearts of all her sons, whatever her need, whatever the occasion.

CHARLES H. TAFT,
Corresponding Secretary.

COLLEGE COMMENCEMENTS.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

Graduates	103
Matriculates	207

KANSAS CITY DENTAL COLLEGE.

Graduates	50

OHIO COLLEGE OF DENTAL SURGERY.

Graduates	89
Matriculates	143

UNIVERSITY OF MARYLAND. DENTAL DEPARTMENT.

Graduates	74

PHILADELPHIA DENTAL COLLEGE.

Graduates	142
Matriculates	259

DENTAL PATENTS.

[WE have made arrangements to have a list of the patents in dental appliances forwarded to us as issued. This will appear regularly hereafter.—ED.]

468,653.—Dental Plugger. George W. Geitz, New York, N. Y. Filed May 21, 1891. Serial No. 393,514.

468,746.—Dental Pliers. Woodbury S. How, Philadelphia, assignor to the S. S. White Dental Manufacturing Company, same place. Filed December 3, 1891. Serial No. 413,898.

468,761.—Artificial Denture. Emory A. Bryant, Aspen, Col., assignor of one-half to Edward P. Rose, same place. Filed December 12, 1890. Serial No. 374,517.

468, 922.—Artificial Teeth. Rufus G. Stanbrough, New York, N. Y., assignor to Robert Seaman, same place. Filed December 9, 1891. Serial No. 414,513.

468,923.—Dental Tool. Rufus G. Stanbrough, New York, N. Y., assignor to Robert Seaman, same place. Filed December 9, 1891. Serial No. 414,514.

469,884.—Dental Heater. Woodbury S. How, Philadelphia, Pa. assignor to the S. S. White Dental Manufacturing Company, same place. Filed January 19, 1892. Serial No. 418,546.

MEETING OF ALUMNI OF THE DEPARTMENT OF DENTISTRY, UNIVERSITY OF PENNSYLVANIA.

The Twelfth Annual Meeting of the Society of the Alumni of the Department of Dentistry, University of Pennsylvania, will be held at the Stratford Hotel, on Thursday, May 5, at 2 P.M. The annual supper to take place in the evening of the same day, at the same place.

Members who wish a place at the supper will please notify the secretary as early as possible.

W. L. Winner,
Secretary.

Selections.

A CASE OF COCAINE-POISONING.

On September 23 a lady, the wife of a railroad conductor, called to have the right superior first molar extracted. The crown was gone ; roots and socket very sore from peridental inflammation. A twelve-per-cent. solution of hydrochlorate cocaine was applied to the surface of the gum twice at an interval of five minutes; none used hypodermically. The operation of extraction gave great pain notwithstanding the use of the cocaine. No bad effects were noticed from the cocaine used.

She had an upper left wisdom tooth to be extracted, but postponed t for another sitting. On the 2d of October (about a week after this) she came accompanied by her husband to have the wisdom tooth extracted. She was very nervous and fearful about the expected operation, and, in fact, was almost in a state of nervous prostration from worry, pain, and loss of sleep, as the tooth had been aching very severely for several days.

This time a twelve-per-cent. solution of the cocaine was applied to the gums as before, after which a four-per-cent. solution of cocaine was injected first on the outside or buccal surface of the tooth and then on the palatine surface, passing the needle deeply into the tissues alongside the tooth,—about one-half inch, I think.

Almost immediately after removing the needle—the last injection—symptoms of cocaine poisoning began to show themselves. The first effects noticeable were those of a person just in the act of fainting, followed in quick succession by violent twitching, convulsive movements of the eyeballs, the general tendency of which seemed to be upward, under the upper lids, crossing of the eyes, etc. The respiration became very short and quick, as if a paralysis of the lungs were coming on; the pulse became very rapid, weak, and thready,—in fact, was at times almost imperceptible. One peculiarity of her condition was, that for short intervals the violent and alarming symptoms would pass away and she would appear to be reacting, but only momentarily, for she would relapse again into more violent paroxysms than before. During this time she was apparently unconscious. There is reason to believe that she was entirely so.

Of course prompt measures were taken to restore her. The chair was thrown back until her head was brought below a horizontal line, cold, wet towels applied to her head and face, her clothing loosened, and a physician sent for. As soon as it could be procured, which, fortunately, was in a very few minutes, she was given a drink of hot, strong coffee; the effect of which was like magic, for her alarming symptoms subsided at once. Her breathing became easier, her pulse stronger, she became conscious,—in fact, in a few minutes she was out of danger. She was very much prostrated, being so weak that it was several hours before she could leave the chair. The physician gave her a dose of digitalis before he left, and she was also given brandy afterwards, but the remedy that relieved her was the coffee.

DR. T. C. EDWARDS,
Texas Dental Journal.

LOCAL ANÆSTHESIA BY AQUAPUNCTURE.

Dr. C. Schleich is convinced, from experiments upon himself and his assistants, that local anæsthesia, sufficient for minor surgical operations, can be obtained by using a spray of ether in liquid vaseline (4 to 1), followed by hypodermic injections of pure sterilized water. The needle is introduced at first, in the usual way, below the surface of the skin and then parallel to it, forming at the point of injection an œdema of the skin. In the extent of this œdema the skin is absolutely insensible.

M. Schleich has, by means of this procedure, made, without pain, in a case of anthrax, two crucial incisions, eight centimetres (three inches) long, and excised and scraped out the dead tissue.—*Les Nouveaux Remèdes*, October 8, 1891, *The Satellite.*

DISINFECTOL.

This substance is analogous to creolin and lysol. It is a brownish-black, oily liquid, having a density of 1.086. It has an alkaline reaction, and contains hydrocarbons, soaps of resin, and combinations of soda and carbolic acid. It has, it is said, very energetic disinfectant properties. It is used in the form of an emulsion containing from two to five per cent.—*Journal de Médecine, de Chirurgie, et de Pharmacologie*, November 20, 1891, *The Satellite.*

THERAPEUTICS AND TOXICOLOGY.

IODO-NAPHTHOL-BETA—A NEW ANTISEPTIC.

M. Braille (*Répertoire de Pharmacie*) has prepared with naphthol-beta and iodine a new antiseptic resembling aristol, to which he has given the name iodo-naphthol-beta, or naphthol-beta diiodide. It is an inodorous, tasteless, greenish-yellow powder, insoluble in water, slightly soluble in ether, freely soluble in chloroform, and almost insoluble in alcohol or acetic acid.—*La Médecine Moderne*, November 19, 1891, *The Satellite.*

THE

International Dental Journal.

VOL. XIII. MAY, 1892. No. 5.

Original Communications.[1]

THE DENTAL PROTECTIVE ASSOCIATION: WHAT IT HAS DONE FOR DENTISTS, AND ITS FUTURE WORK IN THEIR BEHALF.[2]

BY LOUIS JACK, D.D.S.

To enable the dental profession to understand the causes which led to the formation of the Dental Protective Association, it is necessary first to make an inquiry into the character and purposes of the International Tooth-Crown Company.

The first steps leading to the creation of said company are hidden in the brains of its originators, but the leading and active persons connected with it had occupied prominent and unenviable relations with the Goodyear Dental Vulcanite Company, and had learned by experience gained during its activity that in the field of dentistry was an opportunity to reap a rich harvest. They had found, by the apparent impunity with which they had harried the dentists of the country by the unfair means then pursued, how easy they might again lay the dental profession under tribute. They had also experienced the value of making threats to enforce upon individuals the pains and penalties of disregarding any *prima facie*

[1] The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

[2] Read before the New York Odontological Society, February 16, 1892.

rights they might secure by the purchase of valid or invalid patent-claims.

These parties became organized under and pursuant to the laws of the State of New York, and it does not appear that such corporation is any other than a paper affair, organized for the purpose of holding by assignments large numbers of letters-patent relating to applied dentistry, and having no other objects in view than the gathering of profits by assessments and levies made upon the dental profession throughout the United States, under the guise of licenses for the use of procedures, so defended and producing the appearance of danger and peril to such dentists by reason of the aggregation of these various letters-patent, and also by the use of threats and the dread excited by the previous action of the Dental Vulcanite Company. Thus, then, in this manner, it is easily perceived was formed another hydra-headed corporation, which had furbished up the old plans of work and was already employing the agencies its congener, the Dental Vulcanite Company, had used to crush opposition, and were already showing the appearance of an effort to resort to similar means of control of both sides of the expected litigation, to the violation of the rights of the public.

At this point, to enforce this subject, it is well to refer to pages 26 and 27 of the Brief for Appellee in the case before the Supreme Court of the United States of the International Tooth-Crown Company *vs.* Edward S. Gaylord and John S. Williams, which read:

"The complainant corporation being in nowise a producer, or itself practising or employing the alleged inventions of its numerous patents, we assert with confidence that it is pertinent to the merits of this case and the object and merits of this complainant, that reference be made to the dental profession and the past relation and position of its members to the patents of this and analogous companies in this country, for more than a quarter of a century.

"It is a fact well known to most of the learned justices of this court, that, beginning more than a quarter of a century back, the individual members of the dental profession have been subjected to harassment and litigation in every Federal circuit of the United States, by corporations organized for the especial purpose of purchasing and holding patents relating to the various branches of dentistry, and demanding tribute from each member of the dental profession, and bringing suit in the Federal courts to enforce apparent claims in case of refusal. The principal illustration of this fact, so

notorious and prominent that it is believed that this court will take judicial notice thereof, as a fact, was the litigation of the Goodyear Dental Vulcanite Company, carried on by a New York corporation for more than fifteen years against thousands of individual dentists in all parts of the United States.

"During that time the dockets of the various Federal Circuit Courts were simply clogged with these 'vulcanite cases.' A generation of dentists were impoverished by litigation, and there are still thousands of judgments standing upon the dockets of the courts obtained against younger members of the dental profession, so burdensome as to costs and judgments as to completely bar, or greatly discourage, any attempt of their payment or removal.

"This condition of affairs appears all the more unfortunate for the dental profession, when we consider that as a profession there are few, if any, of great or even ordinary wealth, and there are many of great poverty, wholly unable as individuals to defend themselves in any court; and that had the reissued letters-patent in that litigation been subjected to the same rule of construction, comparison, and analysis, as applied to reissued patents since the Miller-Bridgeport Brass Company case, its invalidity would seem to have been a matter of certainty.

"In the case of Smith *vs.* Goodyear Dental Vulcanite Co., 93 U. S. 502, the three learned justices of this court, delivering the dissenting opinion, used the following language:

"'It is too common a case that associated companies, in order to maintain some valuable monopoly, look about to see what abandoned invention or rejected application or ineffective patent can be picked up, revamped, and carried through the Patent-Office, and by the aid of ingenious experts and skilful counsel, succeed in getting the desired protection.'

"We most respectfully submit that the above language is peculiarly effective and correct, as descriptive of the acts and asserted patent property of this complainant, so far as such property is shown to exist by this record."

It mattered little to the Crown Company whether their claims were defensible or not. It was of little consequence whether some of these claims or their modes of enforcing them were plainly illegal or not. They knew well that the individual dentist is peculiarly weak when standing alone. This experience they had acquired during their enforcement of the claims of the Vulcanite Company. This Crown Company, therefore, prepared to magnify

their efforts by the procurement of patents for procedures long in use, and by the purchase of other inventions of which it is now well known they were aware some were illegal and invalid, and which have since been so declared. The company, as stated, has also, in the effort to establish their claims, endeavored to procure questionable litigation by having control of both sides in a manner similar to the methods the Vulcanite Company attempted and nearly succeeded in imposing on the courts. This arraignment is presented to make clear the interests, nature, and the practices of this company, which being in nowise a producer or having any relation to the business of dentistry, has taken advantage of a situation where they have appeared intrenched behind the law, and where those on whom they would enforce their claims are isolated persons, so circumstanced by poverty and the absence of means of defence as to be nearly powerless.

The means the Crown Company has attempted to pursue and had effected upon many individuals is exhibited in the obligations, pains, penalties, and requirements they have imposed in the language of their licenses, the extreme terms and threats being the measure of the inherent weakness which pertains to most of their letters-patent held by assignment.

This said Crown Company entered into formal suits against Edw. S. Gaylord and Cassius M. Richmond, on what is known as the Richmond Crown patents and the Low Bridge patent. The defence of suit against Gaylord was carried on by Gaylord himself, until a committee was appointed in New York, when, by agreement, both suits were merged into one, and said committee took charge of the defence.

This committee raised and expended over five thousand dollars, and carried the case successfully through the United States Circuit Court, gaining a decision in favor of Dr. Gaylord and annulling the patent on crowns.

The case was argued before their honors, Judges Wallace and Shipman, in the October term of 1886, and was decided February 22, 1887. The bill was dismissed as to both the patents on the Richmond Crown, and on the preparation of roots of teeth for crowns. But the patent known as the Low Bridge patent was declared valid, and, according to the construction of that court, all other forms of permanent bridge dentures were declared an infringement of the Low Bridge.

As soon as these decisions were made public, the Crown Company issued circulars and started their agents with a view of issuing

licenses and collecting royalty as though nothing had happened; making it appear to the masses of the profession that the decision of the court above spoken of was an entire victory for them. And by their peculiar methods they were procuring licenses from all parts of the country.

The signing of these licenses compelled those signing them to always recognize the validity not only of the Low Bridge and Richmond Crown patents, but also of some thirty-odd other patents owned by the company, which were included in this license-contract. In the mean time the Crown Company had appealed that part of the record relating to the Richmond Crowns which had been decided against them in the lower court to the Supreme Court of the United States.

It soon became apparent that something must be done, so a conference of several of the well-known members of the profession in New York and other parts of the country was held in New York, to meet the counsellors, Mr. S. J. Gordon and Mr. J. K. Beach, and discuss the situation. At this meeting Drs. McKellops and Crouse were urged to take up the work and relieve the committee in New York. It was at this meeting that Dr. Crouse agreed to take the matter under advisement, and also pledged himself to do something; but urged that it should be done by a larger proportion of the profession, in order to distribute the financial tax among a larger number; and also, so that those who could give valuable testimony would more willingly do so than they would to a local organization formed for that purpose.

The dental profession is indebted to Dr. Crouse for his energetic and self-sacrificing action in so promptly and effectively organizing what is now known as the Dental Protective Association. This Association was formulated in a manner so simple and effective in its nature that its action is little liable to interference, with every preparation for active defence and safeguards for the security of its funds. The officers are a president, vice-president, treasurer, secretary, and board of three directors. The by-laws invest large powers in the board of directors to insure prompt and energetic action, and so enable them to meet every emergency and device which may be attempted to be imposed upon the public.

To be ready to make fight whenever opportunity offers, and to resist by astute action each encroachment upon the rights of the public, and which could only be effective where the power to act is concentrated.

The principal purpose, as declared in the duties of the board of

directors, is "to take charge of the defence of members of the Association in any of the States and Territories when prosecuted for the infringement of patents, the validity of which has not been fully established; and, with the funds of the Association, to retain and pay one or more counsel of their own selection, and to defray all necessary and proper expense of any such litigation."

The second object is to bind the dental profession together for mutual protection, strength, and helpfulness. The procurement of associated effort was based on the payment of ten dollars, and the obligation to pay ten dollars more should it become necessary at any time so to do. In case the membership should be of sufficient numbers, this latter payment would probably never be required.

At the end of the first year the membership was six hundred and sixty, which became nearly doubled the following year, and now is between three and four thousand.

The incorporation was executed in Illinois, and it is capable, through its board, of suing and being sued. It will be seen before this presentation is completed that it is a power in the land and before the law, and that it may become a shield and buckler against any wrong attempted to be imposed upon its members and the public.

THE WORK OF THE ASSOCIATION.

At the time of the organization of the Protective Association the International Tooth-Crown Company had commenced suits against six dentists in Milwaukee, five or six in Baltimore, and about as many more scattered over the State of New York. The Association assumed control of all suits commenced by the Crown Company against members of the profession, except when the parties were licensees of the Crown Company. The defence in these cases was avoided, because it was necessary to be sure of the loyalty of the defendants. The Association's attorneys made service on the Crown Company, and asked the court at Milwaukee to set the time when the question should be argued, and to set and limit the time when the testimony should be made up. The court limited the time to twenty days. Before the expiration of that time the Crown Company dismissed all the suits and paid the costs. The same steps were taken at Baltimore, with the same results, they dismissing the suits and paying the costs. This result was a great point gained in the struggle of resistance. Their avoidance of suit was not only an indication of the presence of the force which was pitted against

them; it was also a confession of their own inability to sustain a suit to be made up anew upon a complete line of defence, supported by the matured evidence the Association had gathered with which to resist the claims of the Crown Company.

From the time of these dismissals the Association commenced taking licensees, regardless of their license-contracts, except in the circuit comprising New York and Connecticut. It certainly is a great result that the Association has thus relieved the dentists of the other eight circuits, so that they are to-day as free from the Crown Company's actions as though all their patents had been declared invalid.

It is easy to perceive the contrast between this and the corresponding period in the history of the Dental Vulcanite Company, when, because of the absence of organization of the dental profession, said company, in their efforts to establish their questionable claim, harassed the country from end to end, neither city nor town escaping,—no game being too small for them. After the operations of the Association commenced, the Crown Company endeavored to intimidate its officers and those aiding them by threatening suit for damage, and actually commenced suit against Dr. Crouse, president of the Association, for sixty thousand dollars and six months' imprisonment as damages. The grounds on which they based this claim for damages were "that the dental profession were satisfied with their methods and way of doing business; that Dr. Crouse had organized the Dental Protective Association out of spite towards the Crown Company, and, furthermore, that, by so doing, he had damaged their business."

This was a queer business which was being damaged,—the enforcement of claims for the use of inventions many of which they well knew, as before stated, were illegal, but the upholding of which were necessary to the further objects they had in view.

During the course of these events, the Association made it difficult for the Crown Company to get new licensees, whereupon they commenced to retaliate upon some of their former licensees who had joined the Association, hoping to get the Association into court as aiders and abettors in the vitiation of contracts. This legal complication was carefully avoided.

In connection with the motion of Mr. Offield, to limit the Crown Company suits at Milwaukee, he filed a cross-bill setting forth the character of the business the Crown Company were pursuing, and the questionable nature of the circular letters, adver-

tisements, etc. These were filed in court, and it was asked that the Crown Company be enjoined from issuing any such documents. While the judge ruled this action out as irrelevant to the question of the validity of the letters-patent, he suggested it be brought up as a separate motion. He stated that no corporation had the right to issue such documents, which were for the purpose of intimidating and misleading the public.

The decision of Judge Jenkins, of the Milwaukee Court, is founded in justice and the rights of men. Corporations, from the very nature of their form and the absence of individual responsibility, tend to the impairment of the rights of those in the relation of defendant, since they proceed coolly to the execution of measures which an ordinary complainant would hesitate to institute. If, in addition to the force of their numbers and capital, they were allowed unrestrained action by their agents and of their threatening documents, the intimidation plainly would be in the direction of debarring the defendant from the free support of his case.

To evolve a clear idea of the character of these documents, it is only necessary to consider the form of their license and to analyze some of their advertisements. The Crown Company resorted to the ruse of employing dentists to give clinics at conventions and also to furnish instruction to dentists at their offices. When these agents became aware that the instructed parties were employing the procedures, they would follow up with their methods of inducements and intimidations. If successful in capturing the victim, the following or similar advertisement would appear in the local papers:

"Dental Notice.—This is to certify that Dr. Albert Robinson, Office No. 65 Monroe Street, is our only licensee to make and furnish to patients in the City of Grand Rapids any Tooth-Crowns, or Bridge-Work, so called, manufactured under the patents of The International Tooth-Crown Co. Said patents are constructed to cover the most practical forms of artificial Dentures now commonly known as Crown- or Bridge-Work.

"All persons are hereby cautioned against obtaining any such artificial Dentures from ANY DENTIST NOT LICENSED, as none are authorized except by the written license of said Company.

"The full legal penalty will be promptly enforced against all *Dentists* as well as their Patients, making unauthorized use of any such patented Denture.

"A reward will be paid by said Company to persons furnishing

it with any cases of BRIDGE-WORK of one two or more Crowns or Bridges made by any dentist not licensed by this Company.

"INTERNATIONAL TOOTH CROWN CO.,
"By JACKSON W. ALWARD, GENERAL MANAGER.
"Dated NEW YORK, Feb. 16, 1889,
"56 WEST 33RD STREET."

This pernicious advertisement sounds strangely in the ears of all men since the decision of the Supreme Court, which declared that whatever of invention these crowns possessed was only such modifications of old and well-known processes as pertained to the ordinary ingenuity of the workman in his capacity, and also that they had several years before been clearly and indisputably dedicated to the public.

As is well known, the Protective Association joined in the appeal to the Supreme Court of the suit of the International Tooth-Crown Company *vs.* Edw. S. Gaylord and John S. Williams, with the result that the Crown Company was beaten upon the claims of the Richmond Crown. In view of the evidence, it is surprising that an astute attorney would have carried their case to the Supreme Court, but the situation of the Crown Company was desperate. It was necessary for them, as before intimated, to secure the validity of the Richmond Crown, for on this was based not only what could be gained by the preservation of the patents covering these, but that without this method of making and securing crowns the other patents upon bridge-work would be rendered precarious. This plainly appears to be so, for the reason that the essential feature of bridge-work consists in the attachments of the bridge. If this were deprived of value to them, the whole plan of prosecution of their purposes would be in fatal danger.

The older forms of dentures were first made essentially as bridge-work is formed to-day, except the mode of attachment, the pieces often not firmly resting upon the gums, and the teeth being attached to bars which spanned the space. It is evident it was necessary, through thick and thin, by means fair or unfair, to make themselves secure upon the claims for the attachments, and they relied, as before, upon their peculiar methods both in and out of court, and upon the weakness of dentists. The result of this decision of the Supreme Court is that the Richmond Crown, with its various modifications, is free to all to use. In giving credit to the sturdiness of the defendants of this case, the dental profession is also under great obligations to the Dental Protective Association

for the part they took in the case, and for the able brief with which it was presented to the court, and particularly so with reference to the clear and pertinent retrospect of the facts bearing on the case.

This brings us down to the present time in the history of the litigation.

It is not difficult to appreciate what would be the condition of the dentists of this country at this time who have been using Richmond Crowns in their practices, and who also have been making bridge-dentures, if the Dental Protective Association had not been in existence. Only the vigorous action of the Protective Association has blocked off the Crown Company from putting a great number of dentists under injunction or tribute, in the same manner as the Dental Vulcanite Company had done. They would have pushed their *prima facie* rights without much hinderance, and the persecution would have been in line with the previous experience of thousands of dentists.

The result has been that the members of the dental profession who have supported the Protective Association have been far more thoroughly protected on the small sum they have paid, than if they had expended a thousand or more dollars in their individual defence.

The second object of the Association, that of binding the dental profession together, has had considerable exemplification. This will become more and more manifest as the number of members is increased. What has already been done in this direction opens up the benefits to be secured in the future, when the dental profession becomes so united as to present an unbroken compact against wrong of whatever character from which it may suffer.

When the Dental Vulcanite Company commenced its exactions under claims which would not now be allowed, and which would not then have been permitted if the attorneys who managed the case had possessed sufficient astuteness, the dental profession was entirely without organized power, and the attempt in this direction which was made by the American Association was stopped by the one who assumed charge of the defence, by the advice that there was "no need of organization for such a purpose." The fatal error of this is now only too apparent.

It must be conceded as a marked result of the efforts of the Dental Protective Association, that the profession, at last, shows capacity to become organized for a given purpose.

It is now more than ever necessary to concentrate the power of

the whole mass for defence, not only against the further unfair attempts of the Crown Company, but upon other equally illegal letters-patent.

This brings us to a consideration of the future work of the Association. There remains abundance for the Protective Association to do. That which immediately lies before it is the defence against the claims of the Crown Company concerning the Low Bridge patent, and to pursue this case to the court of final resort if it become necessary; to defend any of the Association who may be prosecuted until after the claims of the Crown Company are established in the higher courts; and, also, to test, as occasion may require, the validity of any patents of which the claims are of doubtful legality. That which has been done in the past by the Association is a warrant for the singleness, the sagacity, and the energy with which its actions will be guided in the future.

To give the Association the power to act with full force, and to have the reserve strength of abundant capital, it is the necessity of the hour that every one who is not now enrolled in the list of members, and who has any interest in dentistry, should join with the others. In this union is strength, a power not only of money, but of that far-reaching force, the inspiration of the moral impetus which the aggregation of intelligent men give to any cause in which they are deeply interested. The appeal now should be to every one who is not of the Association to become a member. The expense is small, the security is great, and the satisfaction is continual. Self-interest and duty each lay their claim upon every man to enroll himself, and to influence others to do the same.

The individual man in matters of litigation is weak, because he is without the knowledge, the opportunity to secure sufficient evidence, or the means to institute an effective defence; and in the face of the Crown Company or similar corporations, he is liable to be overwhelmed by the peculiar methods they pursue. He is like a single honey-bee, which is defenceless against the attack of an enemy and is killed in the effort, but when he becomes part of a colony, he bids defiance to attack and becomes an overpowering antagonist. In the same manner the units of dentistry may be, by the union of numbers, strong for defence against wrong, and effective to secure the rights of the public.

ALVEOLAR ABSCESS.[1]

BY EDWARD C. KIRK, D.D.S.

MR. PRESIDENT AND GENTLEMEN,—I am compelled to preface my remarks with an apology for not presenting to you a formally-prepared essay, as I have been unable from lack of time to go through the mechanical work of writing a paper; so I will ask your indulgence while I speak from my rough notes.

It would be entirely superfluous to bring before this audience a description of alveolar abscess, as we meet it ordinarily. The clinical expressions of alveolar abscess are well known to all of us, but there are some forms of this disorder that occur infrequently, which have a special importance because of their possible fatal termination; and as the methods of treatment which we should adopt in cases of this sort are so entirely different from those which we ordinarily pursue, it seems not only worth while, but necessary, that we should be able to recognize them from their clinical expression in the very first stages.

Alveolar abscess, you know, starting as an acute attack of local inflammation, runs through a period of from twenty-four hours to a week, which may be required to bring it through the stage of pus-formation. I refer now to the class of cases where we have a large collection of pus, which is of a creamy, yellow character, which, when this is once evacuated, so far as the acute stage is concerned, rapidly subsides. That is what I recognize as the ordinary form.

About two years ago I was called to see a patient, at his house, suffering from alveolar abscess under rather peculiar circumstances. He had been for eighteen months running down in health; his special disorder was a profound nervous prostration, or neurasthenia. The nervous trouble had been progressing until his life was despaired of, but he had been slowly rallying from this. His disorder ran through a period of nearly two years from its inception to termination. It was during this time that I was called in to relieve him of pain in one of his molar teeth. I found a lower sixth-year molar on the left side presenting the symptoms of alveolar abscess as we ordinarily understand it. The seat of inflammation was about the anterior root. He was confined to his bed, greatly prostrated, and, of course, my efforts at treatment were necessarily limited by the man's broken-down condition and my

[1] Read before the Odontological Society of Pennsylvania, March 12, 1892.

inability to properly get at the seat of the difficulty with remedies, owing to the lack of proper appliances for the treatment of such a case by the usual methods in the office; however, the inflammation ran its usual course, and in three or four days the sack was evacuated by lancing, he was relieved, and rapidly recovered from the effect of the attack. The cavity was on the mesial approximal surface, and there was ready access to the pulp-chamber. All I was able to do at the time was to sterilize the nerve-canal and pulp-chamber with tincture of iodine; the tooth was stopped afterwards with gutta-percha, after the canals had been filled with a paste made of hydronaphthol and eugenol.

The long period of his illness made it some months before I saw the patient again, though he came to me as soon as he was able to be out. I examined his teeth and found some slight carious places that needed attention, but overlooked this sixth-year molar, as it was absolutely comfortable, rendering him good service, and had all the appearances of a perfectly healthy, pulpless tooth. The only peculiarity was that the tooth was slightly raised at its mesial aspect, probably from the deposition of plastic material about the apex of the anterior root of the one which had been affected; otherwise the tooth was, to all appearances, healthy. There was no inflammation of the adjacent soft tissues, and no pain. His health became much better, he was able to attend to his business, and was seemingly on the high road to health. Last July he spent the Fourth at Atlantic City, and had "taken cold," as he expressed it. He returned on the 5th or 6th, and came to me complaining of pain in the region of the same tooth that I had treated the year before. I immediately inspected the tooth and found some portions of the paste remaining, but apparently disintegrating, and it was altogether in an unsatisfactory condition. On the border of the inferior maxilla, on a vertical line immediately below the tooth, was a small inflammatory bunch, which was quite dense and hard and attached to the bone, apparently, and immovable. The patient was suffering considerable pain at the time, though an examination showed no inflammation of the soft tissues surrounding the tooth. It was but slightly sore on pressure. The sixth-year molar above had been lost, and considering the critical condition of the man's nervous system, together with the location of the inflammation, which was considerably outside the region of the mouth, I reasoned that if pus had to burrow its way back into the mouth, it would take a long time, and that he was not in a fit condition to undergo the acute suffering that would be entailed. I therefore

advised him to have the tooth removed, which was done by Dr. J. D. Thomas, under nitrous oxide. The next morning, after the removal of the tooth, the patient presented himself for inspection. I found the inflamed area somewhat enlarged, but only slightly, and I attributed it to the irritation caused by the extraction of the tooth. The socket contained two pledgets of cotton, which had been saturated with phénol sodique.

I inquired whether there had been any flow of pus following the extraction of the tooth. He said there had not, nor had Dr. Thomas observed any. I assured him of my belief that the extraction of the tooth would remove the difficulty, and he would soon feel better. The socket was washed out, and cotton with phénol sodique was reapplied. The next day I was sent for by the patient, and found him at his house confined to bed, having had a very painful and restless night suffering from a chill, and again presenting symptoms of profound nervous depression. The inflamed area had enlarged considerably, the skin was tense and glistening over the lump. Examination of the mouth revealed entire absence of inflammation of the soft tissues within the oral cavity. Taking into consideration his general condition, the symptoms indicating where the abscess was tending to form, it became very clear to my mind that to try to establish an exit of pus within the mouth would be dangerous or fatal in his case, because of his lack of vitality and the length of time that would necessarily be required to evacuate the pus from within the mouth, so I decided to poultice the swelling and establish the exit of pus from the outside. He was given tonic treatment, stimulants and quinine, and some morphia to relieve the pain. I then prescribed flaxseed poultices for twenty-four hours, at the expiration of which I found the swollen territory considerably enlarged, involving by this time the whole cheek and down the neck, nearly to the border of the clavicle; the skin had become copper-colored, and the whole surface was hard and tense and the patient very much exhausted from pain. No part of the surface seemed soft,—no place where a most careful examination showed pus to be determining. There seemed to be nothing to do but continue the application of poultices, which was done until the next morning, when by a careful examination with the index finger of the left hand in the mouth, and by careful palpation with the fingers of the right hand over the inflamed area in every direction, I found one small spot about a half-inch in diameter, where there was a slight pulsation observable. Into this I passed a lancet and carried its point to the free border of the inferior maxilla, immediately below the position of

the roots of the affected molar. This was followed by a very slight exudatian of pus, just enough to bring out on the knife-blade. The exudation was of a peculiar character,—glutinous, sticky, and albuminous in appearance, streaked with blood, and only a very slight amount of pus as we usually see it, that which we know as the laudable pus ordinarily evacuated from alveolar abscesses. Poulticing was continued constantly, and the constitutional treatment kept up. The discharge continued of the same character,—slimy and glutinous. The cavity made by the incision was washed with an antiseptic of phénol sodique in the proportion of a tablespoonful to two-thirds of a tumblerful of warm water. This gave some relief, but he was still suffering intensely from pain; the constitutional disturbance was very marked, and was out of all proportion to the pain he was suffering. The even character of the surface of the inflamed territory, which had characterized the condition up to date, now commenced to take on another form: there seemed to be centres where suppuration would present some three or four of them, giving it a hilly or boggy appearance, the surface appearing quite irregular. About four days later, after continued poulticing, a centre of suppuration formed about an inch and a half above and back of the first. This, in course of time, was opened and evacuated. Neither in washing it out nor by exploring with a probe was I able to detect any connection between the two openings. In the course of a week another centre of inflammation suppurated, which was still higher up, just below the ear. This was evacuated. By this time the two original pus-cavities became united, so that I could pass antiseptic solutions in at the second opening and out through the first. The jaws all this time were quite fixed, the patient being unable to open them more than an eighth or three-sixteenths of an inch; his throat was also very much swollen, and he had, so far as I could determine, all the physical signs of tonsillitis. The throat seemed to be closing up, so that it became almost impossible for him to swallow. I watched very carefully to see if there was any discharge of pus from the inside, but this did not occur, as far as I am aware. Later on, another centre of suppuration occurred upon the neck, about two inches below the border of the jaw. This was evacuated in the same way as the others. By this time the original opening commenced to heal, and there was a noticeable turn for the better. His general appearance was improved, and it was evident that the inflammation was subsiding. This state of affairs continuing, he was sent away to a summer resort, and during the summer his

health returned to about normal. There was still some discharge at the first of September from the original opening, but the others had healed up. I saw him in October, and there was at that time a slight periodical discharge from the original fistula.

By this time he was able to open the mouth normally, and I made a careful examination. You will recollect that the sixth-year molar had been extracted; the second biscuspid was a pulpless tooth. I knew that to be in good order, as it was perfectly filled and gave no trouble. The twelfth-year molar up to the time of the first attack of alveolar abscess had been vital, and it presented all the appearances of a vital tooth at the time of my last examination in October. However, on the buccal side of this twelfth-year molar there was a fistulous opening, and extending from it was a red line along the gum to a point about opposite the position of the sixth-year molar which had been extracted. I suspected from this that pus had burrowed along under the gum-tissues, and had found exit at the fistulous opening alluded to alongside the twelfth-year molar. I did not suspect that the twelfth-year molar was devitalized, as it was without a cavity or any defect. Had my suspicions as to its vitality been raised, I should have attributed the fistulous opening there to an abscess from that tooth, but I reasoned that necrosis of a portion of the alveolar process had taken place, and the discharge therefrom was finding exit alongside the twelfth-year molar.

You will remember that at this time every symptom of inflammatory action had subsided, with the exception of a slight scar upon the lower part of the face, which had resulted from the first incision. Once in ten days it would open and then heal up again. I attributed this to the existence of a certain amount of necrosed bone. It seemed to me almost impossible to have had such an active inflammation in this connection without some necrosis of the bone taking place. I tested the twelfth-year molar, and it seemed to respond to all the tests of a vital tooth, but the patient was very nervous, and it was difficult to decide. However, the problem solved itself in a most unexpected way. The articulation of the upper twelfth-year molar to the lower was very close, the palatal cusp of the upper fitting into a depression in the grinding surface of the lower like a wedge, and during a meal he suddenly bit down on something hard and split this apparently healthy lower twelfth-year molar through its entire antero-posterior diameter, which resulted in my discovering that it was absolutely pulpless. It was therefore at once removed, and within a week afterwards the fistulous opening on the face healed, and all traces of

discharge ceased. I have examined the case carefully since then, and am unable to detect any fistula in the mouth, and he is to all appearances quite well. Dr. Peirce saw the case with me in consultation, and approved the treatment which had been carried out; he believed in the existence of some necrosed bone. I have not been able to discover it so far, although Dr. Peirce believes he has detected a point where there is some slight necrosis in the alveolar border.

The case ran over a period of nearly four months before recovery was complete. I want especially to emphasize the infectious character of the inflammation in the case as I have presented it to you. It seems perfectly evident to me that the septic material, which was the primary irritant in this case, was, if produced by micro-organisms from an infective pathogenic germ, different from that which produces ordinary abscess, the staphylococcus pyogenes. I fully believe that, if the case had not been treated upon general surgical principles by free evacuation of the discharge, and by washing out the pus-cavities with antiseptic solutions, and the patient treated constitutionally with stimulants and tonics, he would have died.

I wish to again call attention to the character of the pus-discharge. It was at no time of a creamy yellow color, but clear, viscid, and albuminous in character. It seems to me that this clinical point may be related to the kind of micro-organisms producing it.

If you will examine the literature of the subject, you will find that the effect produced by the action of various micro-organisms upon a given pabulum widely differs and varies in its expression, along with the other vital phenomena, according to the kind of organism or the class to which it belongs. From this view it is of interest to note that in the history of the case two distinct kinds of inflammatory action, presenting very different clinical phenomena, occurred in the same patient; both of these might be regarded as alveolar abscesses; yet one was benign in character, the other attended with alarming and unusual symptoms. The infectious character of the last attack was plainly evident, and if due to the invasion of a specific pathogenic germ, as the researches of Miller warrant us in believing, the unusual character of the discharge, perhaps, may bear a significant relation to the diagnosis in such cases, as its nature would seem to depend upon the character of the invading micro-organism, rather than upon the systemic condition of the patient. This view, I think, is sustained by the occurrence of two distinct forms of suppurative inflammation in the same

patient, and involving the same territory,—the discharged pus being in each instance widely different in character; that is, the pabulum being the same, and the invading organism different, resulted, among other things, in a dissimilarity in their waste products.

The case which I have imperfectly presented is, I think, important. It is of a kind which, fortunately, occurs rarely, and I have felt justified in bringing it before you, with a view to calling out some expression of opinion upon this class of cases.

ODONTALGIA.[1]

BY CHARLES P. BRIGGS, M.D., D.M.D.

This paper is intended to be an enumeration of the causes of pain referred to the teeth, with especial regard to the differential points of diagnosis. Little can be said on this subject which has not been said before; it is hoped that the profit may be found in the relation of experiences.

It is not of infrequent occurrence for a patient to come complaining of toothache; in the majority of cases, from one's records or from unmistakable symptoms, it is made evident, in a very short time, just where the trouble is. Occasionally, however, the diagnosis becomes extremely difficult, and one has to consider all the causes of pain, and reach his diagnosis through elimination.

SURFACE SENSITIVENESS.

One writer says, "In very rare instances an apparently sound and healthy tooth will become the seat of severe and continuous pain, which, for the time, resists amelioration from the application of any of the remedies usually employed. Generally, however, such a tooth, if the intensity of the pain does not necessitate its removal will be found within a limited period to be responsive to local irritants, such as sweet, sour, hot, or cold articles, when brought into contact with some circumscribed part upon the crown, the response manifesting itself as acute but temporary pain. The cause of this morbid condition is but imperfectly understood, and its pathology

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[1] Read at a meeting of the Harvard Odontological Society, November 1891.

cal significance is only fully appreciated when the sensitive surface yields to some destructive agent, resulting in molecular disintegration or caries." Such a spot upon the crown of a tooth must, as this author says, be very rare; but it is by no means uncommon for spots upon the roots of teeth, when there has been more or less recession of the gums, to become thus sensitive, and responsive to a painful degree to the sort of irritation just mentioned. Especially is this liable to occur when the relation of adjoining teeth is such that food is allowed to crowd up between the teeth, where, by its macerating effect and by the action of the acids formed in its fermentation, it brings about this hypersensitiveness of the surface. That this is the cause is proven by the fact that the sensitiveness disappears when, owing to the presence of approximal cavities, it is possible so to contour the teeth that food shall not be wedged up between them. Pain due to this cause is pretty definitely located by the patient, and responds to the point of the examining instrument. That there is no depression or roughness of the surface shows that the condition is not the one next to be mentioned.

CARIES.

Caries, though superficial, may be accompanied by pain wholly out of proportion to the loss of tooth-substance. If caries is the cause of pain, in a given case, it is made evident by the unusual sensitiveness of the spot to the blade of the excavator, as well as by the history of pain in that region after eating sweets and acids.

That the pain from this cause may be distressing and continuous, I can myself bear witness. While eating sweets, I began to feel a pain in an upper wisdom-tooth, which had never given me any trouble. The pain, soon becoming excruciating, lasted an hour. There was no question in my mind but that the pulp was exposed. Examination, however, showed that the caries—the cause of the pain—was very superficial indeed.

HYPERÆMIA AND INFLAMMATION OF THE PULP.

When one considers how narrow is the line between hyperæmia and inflammation (in the one case a congestion of the capillaries of the pulp; in the other, the same condition with the migration of the corpuscle and the exudation of lymph added), it is found that the diagnosis between the two conditions (hyperæmia and inflammation) is difficult or impossible. That it is necessary to distinguish between the two conditions is owing to the fact that, if

the case be one of simple hyperæmia, there may be a good chance of saving the pulp by improving the conditions of the tooth.

Hyperæmia may occur in a tooth apparently sound; more frequently it is found in one in which there is a cavity of considerable depth, or a filling of large size, thus subjecting the pulp to changes of heat and cold. The pain of these two conditions is, pretty generally, definitely located by the patient.

In hyperæmia, the pain is paroxysmal, of a lancinating, excruciating character, and is usually induced by thermal changes. In the intervals between the paroxysms there may be complete cessation of pain.

The same symptoms hold for inflammation of the pulp, except that the pain is not as severe, as a rule, and is more continuous. The pulp does not respond quite as readily to heat and cold.

A convenient and effective way of testing a tooth, to see whether it is responsive to thermal changes, may be mentioned here. A piece of ice, to give a satisfactory result, needs to be small enough to cover but one tooth. When thus small, it is hard to handle, melting before the cold has had time to penetrate the walls of the thicker teeth. On the other hand, heat from an ordinary instrument, as, for example, the ball burnisher, is dissipated too quickly to afford a conclusive test. When an Evans root-dryer is kept in the bunsen-flame till the bulb is red-hot, enough heat is liberated at the tip of the silver point to scorch the fingers as it is quickly drawn over them. Moreover, the heat is kept up to this high point for some little time. If there is any pulp alive in a tooth in question, the tip is pretty sure to find it out. This can be applied, too, at the thinnest part—the neck—without danger of burning the gum.

PERICEMENTITIS.

The prominent symptoms of all inflammation of the pericementum is tenderness on percussion and on movement of the tooth. Pain varies according as the cause of the trouble takes its origin from the margin of the gum, or from the apex of the root. A wedge pressing upon the gum, or the presence of fermenting food in a space between two teeth not easily reached, or a deposit of tartar, may set up a pericementitis. There is some lameness of the teeth involved. The pain, in most instances, amounts to nothing more than a "grumbling." When the trouble is at the apex of the root, however, from extension or inflammation of the pulp, or from the ingress of septic material through the empty canal, the pain, at first dull, soon becomes severe, throbbing, and unendurable. There

is great tenderness on percussion, together with a lifting of the tooth in its socket. Heat does not aggravate, unless after long application, and then to a moderate degree. Cold, on the other hand, brings relief.

An interesting point to be mentioned here is, that in teeth with more than one root, a pericementitis may be set up on one root at its apex, while another root is still alive. Forgetting this, it would be very confusing to drill into a tooth which gave all the signs of pericementitis, and find the tooth sensitive.

NODULAR DENTINE OR PULP-STONES.

This condition is by no means uncommon. The diagnosis, as there are no distinctive symptoms, is not easy, and must be reached by exclusion. The pain is neuralgic in character, and, at first, is not apt to be attributed to the teeth. If attention is called to them, there will probably be found a slight tenderness on percussion in the tooth which is the seat of the trouble. The neuralgic pains are paroxysmal, there being pretty complete relief from pain during the intervals.

HYPERCEMENTOSIS.

What has been said concerning nodular dentine applies almost word for word to hypercementosis. Pain, if associated with the teeth, is neuralgic in character. The affection is much more rare, however, than nodular dentine, or, at all events, its presence is discovered less frequently by the practitioner.

UNERUPTED OR IMPACTED TEETH.

Such teeth may be the cause of mysterious toothache. In rare cases, inflammation of the pulp and pericementum may be set up in unerupted teeth. Impacted inflamed wisdom teeth, from their position, pressed down upon the nerve-trunk, are very liable to give rise to severe toothache, with neuralgia, trismus, and anchylosis.

INFLAMMATION OF THE ANTRUM.

Inflammation of the mucous membrane of the antrum when connected with the teeth, as regards the etiology, or as far as the symptoms are concerned, is due, in most instances, to an extension of an inflammation of the pericementum of some of the teeth which not infrequently extends into that cavity. Occasionally, however, as Garretson mentions in his "System of Oral Surgery," a purulent inflammation of the membrane which, in its origin, is independent of

the teeth may be characterized by neuralgic pains, with a localization in the bicuspid or molar teeth.

A case of antral abscess I have in mind was as follows: The patient complained of agonizing pain in the left upper second bicuspid, in which there was a small distal cavity filled with gutta-percha. The filling was removed. Being found in good condition, the cavity was refilled. It was concluded that the case was one of simple hyperæmia, and, after the application of iodine to the gum, the patient was dismissed, with the hope that the pain would become quiet.

The pain continuing, relief being demanded, the pulp was devitalized, removed, and an antiseptic dressing left in the root. No relief coming from this procedure, a drill was put up into the antrum, giving vent to the pus confined there.

At the outset there are no diagnostic points of this affection, unless earache and ringing in the ears (which are pretty constant symptoms) be mentioned. Later, when pus has formed, there is a feeling as of the running of water when the head is moved from side to side, together with the escape of pus into the nostril of the affected side.

REFLEX TOOTHACHE.

In a case of toothache for which it is difficult to find a cause, the possibility of its being a reflex expression of trouble in some other part of the body, or in some other tooth, must not be forgotten.

As an illustration of the very common reflex toothache of the superior second bicuspid when the inferior wisdom-tooth is at fault, and as an example of the fact that one should never rely upon "subjective" symptoms, nor be deceived by appearances in making a diagnosis, the following case is given:

A patient came to me, saying that her teeth had recently been examined by her dentist, who had pronounced their condition good. She had been suffering from pain in the right superior second bicuspid, the pulp of which she thought had been capped. As the filling—a soft gutta-percha—was leaky, it was removed. The cavity was very deep, and, in most cases, there would have been an exposure of the pulp, but there had evidently been a recession of the pulp, with the deposit of secondary dentine. As the floor of the cavity was hard, and the smallest probe could find no opening into the pulp-chamber, it was determined to fill again, putting an antiseptic dressing at the bottom, gutta-percha and cement on that. All went well for a month, when the patient returned, saying that

the pain was worse than before. An exposure of the pulp was made. The pulp was paralyzed with cocaine, removed, and the roots filled with gutta-percha. The patient was dismissed with the assurance that her pain was at an end. She returned in a few days, saying that she had been in agony. Here was a disappointment for me, a believer in root-filling, for in this case all the conditions had been favorable. Percussion, however, showed that the bicuspid was absolutely without tenderness.

Examination of the lower wisdom-tooth revealed a cavity. This was excavated and dressed, and there was an end of the pain.

Pain may be reflected from more distant starting-points. Slight operations in the nasal passages, such as the removal of adenoid growths and the cauterization of hypertrophied mucous membrane, covering the turbinated bones, may be followed by toothache. Diseases of the eye and ear, of the stomach, of the uterus, and the condition of pregnancy may be accompanied by pain in the teeth.

A case which may be mentioned here as illustrating how the sensation of pain may be reflected from its proper source was seen by me a few days ago.

The patient, a woman, began to be troubled five years ago by neuralgia in different parts of the distribution of the trifacial. The teeth, however, had never been the seat of pain. During all that time she had been under treatment, free from pain, except under the influence of analgesics. The pain having become localized in her ear, she was sent to an aurist. He, finding no trouble, sent her to a neurologist, who, after a careful examination, told her that the only thing to do before availing herself of the last resort (excision of a portion of the nerve) was to consult a dentist. He brought her to Dr. Hamilton, who, finding an exposure of the pulp in a lower third molar, ordered the tooth extracted. In his absence, I saw the patient, when, two days later, she came to report. For the first time in five years, she said, she had been entirely free from pain. She left, filled not with a spirit of thankfulness that her sufferings were over, but with a desire for vengeance upon the men who had kept her under treatment so long, when the trouble was all due to a wisdom-tooth.

In cerebral diseases and hysteria, a patient may complain of toothache when the teeth are in no way at fault.

SYSTEMIC DISEASES.

Finally, syphilis, malaria, rheumatism, and gout may be mentioned as among the rare causes of toothache.

DENTISTRY ONE HUNDRED YEARS AGO.

BY WILLIAM DUNN, JR., D.D.S., FLORENCE, ITALY.

A QUAINT and instructive old book is that written by a certain Antonio Campani, "public dentist of the city of Florence." Its title is as follows:

Odontologia. | ossia | Trattato sopra i denti | Opera | di Antonio Campani. | Pubblico Dentista Fiorentino | Nella quale si ragiona dei mali | dé denti, e loro cura, e specialmente della maniera di estrarli. | Firenze MDCCLXXXVI | per Gaetano Cambiagi | Stampator Granducale.—con licenza dei Superiori.

It is now a very rare work; the only copy I know of, dusty and bound in parchment, but still in excellent preservation, being the property of Signor Cianchi, surgeon-dentist in this town, and a distant relation of the author.

The book was edited by one Cambiagi, in 1786; so that it is over one hundred years old.

Of the author himself we are acquainted in a rather diffuse autobiography prefaced to the work: Born in Florence, he seems from the first to have been surrounded by professional influences, for his father was also a dentist, and kept him at work as soon as he left school.

At the age of twenty he must have become weary, for he enlisted, and soon after his regiment, much to his chagrin, was ordered off to Poland and Moravia to fight the Germans. When he returned, wounded, to his native city, the public dentist who was his predecessor, one Larini, died very opportunely, and Campani begged the Grand Duke Francis I. to grant him the place of the defunct professor "for the benefit of the public."

In the first part of the book, which he considers the more important, the author treats of the qualities necessary in a dentist to be successful, and the first condition he lays down is that he must be a young man of spirit, full of courage, with a compassionate heart but a cruel hand. He must be able to inspire confidence and know everything by heart which concerns his profession, for, if asked questions by "people of quality," he must be able to answer like an intelligent professor, and not like an ignorant charlatan.

Ideas on embryology are not quite up to date. According to him, the enamel is deposited from the inner surface of the alveolar

ack *onto* the tooth-germ, in the shape of a "humour" which onsolidates.

Perhaps the most interesting chapter in the book is the one vhich treats of the causes of decay: Starting from the theory that he teeth are bones, he remarks they are not covered by flesh, like ther bones; and the enamel is not sufficient protection for the uids constantly circulating in the roots of the teeth, fluids which, nder the influence of heat and cold, condense and coagulate, and hus decompose and soften the tooth substance.

Teeth decay more quickly if the fluids they contain are very ense or badly constituted, as they stagnate more easily.

Among other causes of decay are a bad digestion, any passion hat will dry up or modify the blood, the exposure of the head to ight-air, and, lastly, the remains of food between the teeth.

Tartar is not only due to acid eructations and emanations from ne stomach, but also to the descent of vitiated humors from the rain (*sic!*).

A large part of the work is devoted to extraction, which is per-ormed usually with the old key, but also with levers and pincers nvented by the author, and which he describes with copper-plate llustrations.

It is curious to see how much trouble he takes to describe hich teeth may be dexterously and easily removed, and how an gly-looking tooth or root is best left alone, so as not to endanger ne life of the patient and the honor of the professor.

Of prophylaxis and dental hygiene not a word is said; but two ystems of the treatment of decay are described,—filing, for which e indicates small files of various shapes, all of which he illustrates, nd stopping.

It is worthy of note that, in speaking of files and keys, he says ne instruments must be got from England, where they were made greater perfection than elsewhere.

Stopping was done with lead-foil. Teeth decayed on the masti-ting or buccal surface were good for stopping, but proximal cavi-es were hopeless, for the "air would still pass through, even after e plugging was completed." The cavity was cleansed from food nd saliva with a probe, and then a lead-foil pellet was pressed in, st with the finger, then with a ball-burnisher, which also served smoothen the surface.

When a patient "of quality" came along, it was customary to y a gold-foil pellet on the floor of the cavity; but the completion ith lead-foil was deemed necessary.

When inserted by an expert hand, such a filling sometimes lasted several years.

An exposed pulp was cauterized, and the instructions given were to place the operating-chair near a wall, so that the patient might be steady, and not tip the chair backward on the operator. Then a suitable instrument was taken and made red-hot in the flame, and immersed in the pulp three or four times.

A certain *naïveté* comes out when the author says that if the tooth still gives trouble, after all the different processes have been tried, it showed that the disease had reached a point that would not admit of any cure, and then extraction would be the only course open. Doubtless, when the patient had gone through operations like the actual cautery, he must have come to the same conclusion.

A few more chapters are devoted to prosthetic dentistry. The artificial teeth or sets were made of ivory, and tied to the adjoining natural organs with catgut or silk. Another way he had of attaching sets when the alveolar processes were well pronounced was by springs, which clasped the processes on the palatal and labial side.

Some of the certificates left to Campani by grateful patients are so exquisite that we will close with the translation of one of them. It is from a Venetian prelate, who had been suffering for some time with alveolo-dental abscess with external fistulous opening; and after consulting no end of "professors" in this, as well as in other cities, came to Campani on the 28th of September, 1780:

". . . But notwithstanding all the persuasions of my friends," writes he, "I confess that I had not courage enough to have the tooth pulled; till one day, accompanied by two of my friends, who witnessed the operation, and who undersign their names, I decided to come to Professor Campani, who extracted my tooth, by many others declared to be a dangerous one, with such delicacy that I scarcely experienced any pain; and at present, thanks first to God, and secondly to the most skilful Professor Campani, to whom I protest myself eternally grateful, I am in perfect health again."

The signatures of patient and witnesses follow, accompanied by the sacramental m. p. (manû propriâ); and doubtless their grandsons walk the streets of Florence to this very day.

A GOLD CROWN WITH PERFECT ARTICULATING SURFACE.[1]

BY DR. L. C. BRYAN, BASEL, SWITZERLAND.

The gold crown, models of which are presented in the various ages of its construction, is very simply made, and accomplishes more successfully the objects of a gold crown for all varying and irregular cases than those made in rigid forms or stamped up by one of any number of dies. No set of dies, even the forty of which Dr. Miller presented to this meeting, will give a perfect articulating surface to the antagonizing teeth in all cases, and the outfit usually necessary to one who will undertake crown-work is so large and complicated that the busy practitioner is inclined to consider the undertaking too great to become familiar with its details, and add to his stock of laboratory tools an additional outfit with which he may not succeed. The Mellotte moulding-box is the only outfit required in addition to the usual laboratory tools for metal work for this crown.

The root is prepared, treated, and filled in the usual way, after which an impression and "bite" are taken and models made and mounted in the articulator. For this purpose the crown impression-cup of Ash & Sons, passed around, is the best, as the root and adjoining teeth and the antagonists are all taken in one cup and can be set in the crown articulator, securing an immediate bite, adjusted and ready to proceed.

The method of Mr. Parris, given in Ash & Sons' *Quarterly* for June, 1891, of filling soft copper amalgam into the impression before pouring the body of the model in plaster, where much use is to be made of the models, as in trying in rings, fitting clamps, etc., is to be highly recommended. The articulated models being ready, the plaster at the gum is cut away around the root to the depth that is desired to fit the band or ring below the gum margin. The ring is made and adjusted to the model as high as the bite will allow, filed flat on its upper surface with a broad file, and filled with modelling composition. The ring and its composition filling may now be tried in the mouth, if convenient, and the bite taken in this way or the crown be finished on the models. In the latter case, with the ring and its soft composition in place on the bite, model in

[1] Read before the American Dental Society of Europe, at Heidelberg, August 4, 1891.

the articulator. The models are closed and the antagonizing tooth or teeth pressed into the composition to indicate the bite. The composition is then artistically carved away to represent the desired masticating surface with its sulci and cusps, care being taken to have the surface of the carved composition-crown just so far removed from the antagonizing tooth as the thickness of the gold plate used for the surface cap. An impression of this composition crown-cap is now taken in mouldine, which is simply a kind of artist's clay mixed with glycerin. The metal accompanying the mouldine is fused in a spoon over a gas or spirit lamp, and is poured into the clay impression. This model represents the free edge of the ring and the carved surface of the desired crown. A sheet of crown or pure gold is now laid on a block of lead and this metal die hammered into it until the desired cusps are formed. This is now trimmed and the resulting cap fitted on the ring over the composition and a good joint secured. The ring, cap, and composition are now removed and bound solidly with fine iron binding-wire.

The composition being removed from the ring, the ring and cap are soldered firmly together, the cusps in the cap being filled level full of solder to give strength and durability to the crown's masticating surface.

In the carving of the composition, to represent the desired crown surface, there is an opportunity for the display of high artistic skill in reproducing the lost crown while conforming to the articulation, or the same success may be attained in securing a perfect articulation by the most unskilful carver.

HISTORY OF DENTISTS WHO HAVE GRADUATED UNDER DRS. HARWOOD AND TUCKER.[1]

BY DR. E. G. TUCKER.

Mr. President and Gentlemen,—It is sometimes pleasant to refer back to former times and persons. Perhaps it would be interesting to our young friends to learn what has transpired and originated from two individual dentists who were associated for many years as early as 1830,—Daniel Harwood, M.D., and Joshua Tucker,

[1] Read before the American Academy of Dental Science, January 9, 1892.

M.D. They were truly lovers of their profession, and desired to develop its progressiveness in all its liberal branches.

The following persons received from one or both of said doctors, in person, the principles of filling teeth with soft gold-foil and strictly hand-pressure. Each of the following dentists has left an honorable record in his different location: Dr. W. W. Couma, Boston; Dr. Blood, Worcester; Dr. S. B. Straw, Bangor; Dr. Hawes, Providence, R. I.; Dr. E. G. Tucker, Boston; Dr. Jos. H. Foster, New York; Dr. Eldridge Bacon, Portland; Dr. Horace Kimball, New York. Under the care of Joshua Tucker and E. G. Tucker were: Dr. Benj. Codman, Boston; Dr. Henry Jordon, Boston; Dr. Edward Gage, Paris; Dr. R. H. Gage, Mobile; and later, under the care of Dr. Joshua Tucker: Dr. Elisha T. Wilson, Taunton; Dr. Geo. T. Moffat, Boston; Dr. L. D. Shepard, Salem; Dr. E. P. Bradford, Boston.

I have simply enumerated facts without attempting to enlarge on individual attainments, which would take up too much of your time and are too well known to the profession to need any word of mine.

I would further state, that in 1830, the late Joshua Tucker brought from Cuba a receipt for mineral teeth, and with joint hands of the doctors and the perseverance and industry of the late W. W. Codman, M.D., in the laboratory, mineral teeth became a factor in mechanical dentistry.

REPLACING PORCELAIN FACINGS.

BY E. B. WHITE, D.D.S., SYRACUSE, N. Y.

I DESIRE to present briefly a novel, simple, rapid, and yet practical system of replacing the porcelain facings of crowns that have become fractured.

FIG. 1. FIG. 2. FIG. 3.



Ever since the advent of artificial dentures teeth have been broken in the mastication of "soft bread," and since faced crowns

have become so prominent and essential, we have been racking our brains in order to devise some means of repairing the damage done by the destructive attacks of this seemingly harmless edible without removing the crown or bridge from the mouth.

To the man whose soul is in his work there must come ideas quite as numerous as the hours he works, and in locking them up within himself, instead of sowing them broadcast, he is outraging his privilege and duty to the public as well as to the professional fraternity. We are all educators, and human, if not professional, ethics demand that we co-operate for mutual enlightenment and advancement.

Our patients expect us to keep in touch with each other, so that, when necessary, another may intelligently begin where one has stopped.

Our crowns and bridges go to all parts of the world, and knowing that, should an accident occur, they may be properly cared for, because we have exchanged thoughts and experiences with our antipodal brother, should be a sufficient reward for imparting our ideas to others.

In submitting the following method, I feel confident of the approval of those to whom the repair of fractured facings has heretofore been a source of annoyance: After a suitable facing has been selected, drill a hole through the bridge or crown and enlarge it with a small fissure-bur to a horizontal slot (Fig. 1), of sufficient width and length to admit of the pins on facing and in proper position to allow the facing to be fitted to place. After grinding the facing to fit, bend the ends of the pins together and solder, forming a loop (Fig. 2) of sufficient length to reach nearly through or to within about a line of the inner surface of the gold. Then, with a fissure-bur, make a groove on the inner surface of the gold, slightly larger at the upper than at the lower end, at right angles with and across the centre of the slot (Fig. 3) of proper depth to insert a pin through the loop on facing. Make a tapering pin to fit the groove, and after filling the slot and groove and covering the anterior surface of the gold—which now serves as the backing to the porcelain—with creamy cement place the facing in position and insert the pin in the groove and loop with force enough to make it tight and the facing solid. After the cement solidifies, grind the pin even with the gold and polish.

This makes a most strong and durable repair without any possibility of the porcelain twisting or getting out of place, and can be done in thirty minutes.

Reports of Society Meetings.

NEW YORK ODONTOLOGICAL SOCIETY.

A REGULAR meeting of the New York Odontological Society was held Tuesday evening, February 16, 1892, at the New York Academy of Medicine, No. 17 West Forty-third Street, with the President, Dr. Woodward, in the chair.

The minutes of the previous meeting were read and duly approved.

INCIDENTS OF OFFICE PRACTICE.

Dr. Howe.—I have discovered from conversation with several of my friends that they have not read a paper published in the October number of the INTERNATIONAL DENTAL JOURNAL, by Dr. E. A. Stebbins, on the treatment of caries of the teeth by nitrate of silver. I rise to call the attention of those present to that paper, and urge upon all who hear me to read it and begin to put the suggestions into practice. First, that they may prove the method, and secondly, that they may get the experience to discuss the subject at a later date. I have very good hope that Dr. Stebbins will, within the year, come to New York, and perhaps show us some patients whose teeth he has treated with nitrate of silver. The paper, and his series of experiments, have impressed me as being very valuable, and containing many very important suggestions in our work.

Dr. Littig.—Would it not be well for Dr. Howe to suggest how that is used?

Dr. Howe.—It seems unnecessary that I should take up the time of the meeting in explaining what is contained in the paper. I urge the reading of the article; it will be more satisfactory than any report I could give of its contents.

Dr. Dwinelle.—I have a little matter that I would like to lay before you. A few weeks ago I was making a very important filling,—one of those cervical fillings that extend under the gum,—and when about half through the operation, it got wet. I disliked to give it up, as it was a very important one, and I was tempted to go forward. I was using the new mat gold, brought out by the Johnsons. Though completely submerged in water, I renewed the oper-

ation by adding gold to that already consolidated. I directed my assistant, after annealing, to lay one flat piece after another upon it, and then I used a little engine-burnisher in the shape of a tomato, which I call my hammer-burnisher. I applied it to the gold, commenced rotating it, and, to my surprise, I found it adhered. This rotating principle was so effective that it induced adhesion. I proceeded, and completed the operation very successfully. I showed it to some of my friends, and they pronounced it solid and thoroughly integrated. I have some specimens here that I will show you. They have been tested by instruments accompanied with a great deal of pressure. I do not recommend filling teeth under water, but when you get caught, as I did here, I think it well to take advantage of the fact that you can, by using a burnisher of that character, force the gold into itself. You can integrate it, so to speak, and make a success out of a failure. I do not recommend filling teeth under water, as I said before, but it is very desirable, under circumstances such as these. I have made sections of these water specimens, and find they endure the most practical test.

There is another subject I want to talk about. In regulating teeth we often use wires. We connect the teeth with a twist and that twist is forever untwisting. I have adopted an expedient that makes it very easy to do a difficult thing. I make my wires loop-wires. I connect them by a portion of solder, and in that way have much greater efficiency than under ordinary circumstances. I take two loops and bring them together, and have a mere speck of solder to connect them. Each time you commence "*de novo;*" you are solid from the foundation. I will have them passed around, and they will probably recommend themselves and suggest the advantages to be derived from them over an ordinary twist. You will be surprised to learn how, by thus connecting the loops, it facilitates and gives permanency to the operation of wiring the teeth.

I saw a very beautiful burnisher in Dr. Northrop's case,—a tomato-burnisher, made of agate, I think,—which he obtained in Europe. A rotary instrument of that kind is effective in a great many ways. My experiments were very successful. They are as hard as any fillings that I have ever made.

I use copper wire, for I find it tougher than any other metal. It does not oxidize in the mouth, has no taste, and is always bright and clean.

Dr. Bogue.—Five years ago I put in a number of oxyphosphate fillings, Poulson's cement. I again saw the patient to-day, and I find

hose fillings still in the teeth. Adjoining the fillings are cavities arger than the fillings by a good deal, yet the fillings remain. They re a little roughened on the surface, but they are there, and protect he portion of the cavities not decayed. I speak of this because ne or two gentlemen here have inquired what the cement was that used. It is Paulson's, and is made in Hamburg, Germany; it ught to be easily procurable here.

Another thing that I have lately run across in one of the jour- als (I have forgotten who the author is), although it is an old emedy, is granulated chloride of zinc, for obtunding sensibility. t is so potent a remedy that I should like to have other gentlemen ry it as well as myself. I find that where the patient is extremely imid, if I wish to get rid of sensibility, and have not the fear of de- truction of the pulp, a little pure cocaine, or rather cotton dipped nto carbolic acid, and then into powdered cocaine, will obtund the ensibility enough to put in granulated chloride of zinc with little r no pain. It deliquesces very speedily. In a minute and a half he insensibility of the cavity is often complete.

Dr. Howe.—Only in the pulp, did you say, Dr. Bogue?

Dr. Bogue.—I did not say; that is what I want you to share the esponsibility of. I am not aware of ever having done harm to the ulp, but I cannot assert that it will not do harm. The granulated hloride of zinc is quite fine. It will stay in that condition just a ittle while. You keep it in an hermetically-sealed bottle. You can ut a grain or so into smaller bottles at a time, but it will deliquesce nd get into solid masses very quickly.

Dr. Dwinelle.—In a paper I wrote some time ago I recommended hloride of zinc, which has been suggested. I not only recom- nended using the salt pure on sensitive dentine, but enforcing its ffectiveness by heat. I had steel bulbs of different kinds, which, fter heating, were put into the cavity and literally cooked the in- ide of the tooth. This can be done with impunity. I never lost a erve by the use of it.

Dr. Ottolengui.—I believe most of the gentlemen know that I ave paid some attention to this subject. When I hear a statement ade that anything put into a cavity will obtund sensitive dentine, feel inclined to think that it will only do so sometimes. I had a ooth in my own mouth which needed filling, and as it was very nsitive, I prepared to endure the pain. My dentist said he could uarantee that my tooth would not hurt me at all if I were willing submit to what he would recommend. He gave me about six rops of chloroform on a handkerchief, and asked me to inhale it

until I felt that it was having an effect,—not to go to sleep with it, but to be able to tell him myself to go on. I did that, and I was very much surprised to find that the first effect is the same as that of nitrous oxide. I gave the doctor the signal, and was as conscious as I am now, and told him when the tooth became painful again; but by that time he had almost completed the work.

The point raised in my mind was, that it is claimed by surgeons that to operate under partial anæsthesia is more dangerous than when the patient is put thoroughly to sleep. We know chloroform is not safe to use. The question arises, however, whether the operation of cutting a tooth under so very powerful an anæsthetic is dangerous. I have used it on three patients in my own office, and it has been successful. That statement is believable, because we know that chloroform will obtund any pain, and it seems to me that if it is a safe operation, we have the solution of the problem in a nutshell. I thought it of sufficient importance to bring up before this meeting, and I would like some one to tell me whether there is any risk about it. I know that so careful a man as Dr. Brockway has done it for years. Dr. Van Woert did it for me. I had heard of it, but did not believe it. I would be much indebted to any one who will tell me if it is dangerous. If it is not, we should all practise it. So little is necessary, and the control of pain is so admirable, that it would seem advisable to use it.

Dr. Northrop.—Does the speaker know anything of the history of Mr. Harper's daughter-in-law, who died under such circumstances?

Dr. Ottolengui.—Was the narcosis complete?

Dr. Northrop.—No; she merely took a small quantity of it to have a filling removed. She said her former dentist had been in the habit of giving her a little, and she insisted upon the dentist giving her a small quantity. She died of the effects.

Dr. Ottolengui.—I am very glad now that I know of this. I thought there was a danger, but I wanted some corroboration of it. I should think a single death of that kind would deter us from using it.

Dr. Mills.—The use of chloroform has been common to me since 1874. I use it as taught me by the late Dr. Riggs,—by alternate inhalations from a bottle. I only secure what is called the analgesic effect,—loss of sensation, without loss of consciousness. It has become so pain-saving in hundreds of cases, that I deem it a great blessing. I have yet to see a single case in which *any* unpleasant conditions have arisen. I have used it, personally, carrying the effect to loss of sensation, and directing the cutting of a very pain

ful abscess without hurt. The operation was performed by the late Dr. Atkinson, who pronounced it a decided success. I published a paper, five years ago, in the *Archives*, giving in detail my practice, etc., with it.

Dr. Weld.—I wish to say that there is in one of the medical journals of this week an editorial on the subject regarding the use of chloroform and ether. We all know the effects are very different. The action of chloroform depresses the heart. The action of ether depresses the muscles of respiration. At the same time the man who wrote the paper—I forget his name—stated that in England the mortality as between ether and chloroform was about equal. It may be possible that a person may inhale a little chloroform and die from the depressing effect it has on the heart's action. At the same time, according to the record and according to the statistics, ether, which is supposed to stimulate the heart's action, so to speak, causes as many deaths as chloroform. I do not believe, unless there is some other reason for it, that chloroform does produce death very much oftener than ether. Perhaps some one can produce different statistics; but from what I have read, I feel very doubtful that the inhalation of chloroform will produce death *per se*.

Dr. Dwinelle.—It is well known that in former years it was used, under all circumstances, for the simplest operations; but latterly the views have changed in reference to it, and now it is never used unless necessary. I have given it in almost every known surgical operation. I was the first to do so in my vicinity in the country many years ago, but I rarely use it now. There seems to be no system about its use. Not long since I administered it to a physician's wife; he had used it previously, and the patient died on his hands; and yet we felt justified under the circumstances in giving it.

The President.—The subject before you is one of such importance that your executive committee has thought it wise to devote an evening to it. I will say that the Dental Protective Association has been very happy in the choice of one whom we are all pleased to welcome. No one will present this matter in a better light than Dr. Louis Jack, of Philadelphia.

(For Dr. Jack's paper, see page 321.)

DISCUSSION.

Dr. Francis.—When we see one like Dr. Jack, who has a very large office practice to look after, giving so much of his time in behalf

of the profession, and are also aware of the fact that Dr. Crouse has given so much to the same object, it seems to me that the dentists of New York and elsewhere ought to become more interested in the Protective Union. Dr. Jack's reference to the old vulcanite suits brings forcibly to mind the time when I was one of the committee appointed to collect funds to defend dentists against the extortions of the Goodyear Company. I, however, found it very difficult to collect money sufficient to pay our expenses. I now urge every one in this room who is not a member of this Association to become one, and also to influence his professional friends who are not members to join us. Do not let the burden of the work fall upon the shoulders of two or three; but all do your share.

Dr. Hill.—In order to give this a practical turn, I suggest that every one in this room who is not a member of this Association give his name to the president or to the secretary. Let the secretary forward that name to Dr. Crouse, and then Dr. Crouse will send on the by-laws for him to sign, and he can send his ten dollars and become a member. New York is far behind in the matter of membership in the Association, and it is very unfortunate, because there is more money in this city than elsewhere. As we all know Dr. Crouse and the others regret that New York and Connecticut do not take more interest in this matter. The money that is spent will be mainly spent here; and gentlemen should become members.

Dr. Hoyt.—I would suggest that any person who presents a name to the secretary should give ten dollars; that would be the safest way.

Dr. Weld.—Four or five months ago I knew nothing about the Association. Dr. Crouse sent on by-laws, and also a blank note. I do not know whether any other members of the profession received anything of that kind. It was about May or June. He said, "Fill out this note for three months, for ten dollars." When Dr. Crouse was here, I paid him the ten dollars. I presume there are other gentlemen here, perhaps young men, who would like to do the same thing. I think Dr. Crouse will accept a note for three months, as well as the ten dollars in cash.

Dr. Howe.—I am glad Dr. Weld spoke of the liberal manner in which the Dental Protective Association is willing to deal with members of the profession, in order that they may all have the opportunity of joining the Association, whether it is convenient to pay the ten dollars at the time or not. The Association offers to receive a note for the amount, and make the person a member of the society on his promise to pay. The benefits of the past work of

ne Association must be apparent to every one who knows anything bout the relation of the Tooth-Crown Company to dentists, and the entiment of common interest which is manifested by those who have orked for this end is shown in the fact that the probability is that he men who have done most for the Dental Protective Association ave done almost nothing in the way of crown- and bridge-work. The number of members of the Association, although large, is not alf or quarter what it should be. I do not know how many nembers New York has, but it certainly ought to be a great deal arger than it is. The young men of this city ought all to be members. When they realize that Dr. Crouse and others, like Dr. Jack, re working for this organization in an entirely disinterested way, hey should show their appreciation more than they have done. The whole work has been accomplished in response to a desire to nake dentists more united, giving them more of a common interest, nd a common and united power.

Dr. Ottolengui.—There is not any subject in which I am more nterested than this one. What I am going to say now is not inended boastfully, but I wish to tell my own experience with his Association, simply to show how much more can be done by orking than by recommending and doing nothing yourself. When joined the Dental Protective Association, I told Dr. Crouse that, aving been convinced that his Association was doing good work, nd having decided to join it, I would guarantee to get for him wenty-five members. He gave me twenty-five blanks, and I sent im fifteen members within two months. Since then I have sent im some more of the twenty-five; and when I hear that there re three thousand or four thousand in the Association, I am ratified. I want to point out some of the obstacles which I have net with in doing that work. While the charge made that New ork is behind in membership is true, there is an explanation in it n this: That in proportion to the number of dentists in the State, e are greatly behind in the matter of membership in dental socieies. Now, when a mass-meeting for the Dental Protective Assoation is arranged, as was done hurriedly last month, and when the all is canvassed, the difficulty of getting new members lies in the ct that almost all the men are members already. Out of an tendance of between one hundred and fifty and two hundred, er one hundred and fifty declared that they had been enrolled. hat is not a good field to work in; consequently the same thing, I ophesy, will occur again unless something is done in that direction.

It seems to me that some sort of effort should be made to get

members for the Dental Protective Association from men who are not members of dental societies. I should be very glad if every one in this room would not wait until the mass-meeting, but would go there and say, "I have, during the last month, been able to persuade four or five to join the Association, and here is the money for them."

Dr. Hill.—I do not blame Dr. Crouse for being tired and disgusted with urging men to join this Association. In all the litigation that has been going on for years and years, a few men have paid the bills. At the last meeting the question was quite seriously discussed of not letting any more become members, on account of the absurdity of going around and having to coax men to join.

Dr. Edward C. Kirk.—I think anything I could say before this intelligent body of practitioners would be in the nature of carrying coals to Newcastle. Every dentist has seen the usefulness of this Association, and should embrace the opportunity of becoming a member. The question seems to me to be a strictly business one. It is a question whether you will fight your own battle and pay a big price, or whether you will pay ten dollars to the Association and let it fight for you. It is somewhat like the matter of life insurance. It is not necessary to question the legitimacy and correctness of life insurance from a business stand-point in the latter part of this nineteenth century. There is a point which Dr. Jack touched upon which seems important to me. No doubt it has been said many times before, but it will not hurt to emphasize it again that is, the limitations of the Dental Protective Association. It has nothing whatever to do with the question of ethics. It is a question of deciding between patent-rights and wrongs. The Dental Protective Association concerns itself with patent-wrongs entirely not whether dentists should hold patents or not, but merely with the validity of them. We are loaded down with innumerable patents which we believe have no legal foundation, and until such patents have had a court decision as to their validity, the owners of them cannot expect tribute from any who use them. It is this burden of unjust taxation which the dental profession has suffered and which the Association proposes to remove.

There is one other point that may have restrained a certain body of men from joining the Association. I have reason to believe from such observations as I have made in reading and in the discussions which I have listened to, that on the ethical question as to whether it is right or wrong for a dentist to hold a patent, the profession is not only divided, but there is a large class of men who

in their hearts, if not openly, are in favor of patent-rights in dentistry, and I believe the impression has gotten abroad that the Association exists simply to carry on a crusade against patentees. This, I believe, is not so; but, whether it does or whether it does not, it is morally certain that it cannot get back of the organic law of the land which has created the patent system. If a man has a legal right to his patent, if it is valid, he can operate under it. We may create a moral sentiment against him, but, legally, we cannot take it away from him. In any case of litigation on the part of the Association involving the validity of a patent, if the patentee wins this suit, his patent is, by reason of the decree in his favor, just that much stronger.

Dr. Dwinelle.—The effectiveness of combination to resist a common enemy was very well illustrated in the old Dental Protective Union, which was in vogue a number of years ago. I had the honor of being its first president, and believe I am president of it now. We were a very formidable enemy to our opponents, and Bacon once told me, after the matter had passed, how very near we came on one occasion to defeating their entire efforts. If we had known the vantage-ground we occupied, we would have been successful. As has been suggested here to-night, the old motto, that "in union there is strength," has never been verified more completely than in this "Protective Association." It is a very complete exemplification of it. We were not as well organized then as we have been since, and the consequence was that the burden fell upon a few. I can testify to that; and even could show the figures. Out of my own private purse I expended about nine thousand dollars. Other dentists spent a great deal. It is put on a wiser basis now, to have the cause more common, more extended in its reach. The moral influence, as well as the pecuniary, is better. Crouse is right, and he ought to be sustained to the utmost. I hope we shall surprise him by the liberal share we shall take in the matter. I think there is a great deal of wisdom manifested in the management of the organization. We profit by experience, and I believe that we shall prove so formidable in our efforts that we shall utterly annihilate our common enemy, so that we never need fear him or his unjust and unholy cause in the future.

Every individual in the profession is under the greatest obligation to Dr. Crouse for the sacrifices he has made for us, and for the great persistency and ability he has displayed, not only in defence of our cause, but in the formidable *aggression* which he has seen fit at times to mete out to our common foe.

I speak feelingly on this subject, for, as I have intimated, I had considerable experience in a former "Dental Protective Union." Had it been carried on and been under the wisdom and direction of Dr. Crouse, instead of the two lawyers we employed, we would never have been obliged to discharge the one for his dishonesty, and the other for threatening to go over to the enemy, unless we gave him an additional fee of ten thousand dollars. This latter individual, although the dentists had paid him five thousand dollars already, held Drs. Walter Roberts, J. B. Newbrough, and myself personally responsible, and sued us for ten thousand dollars and costs. We finally beat him, after proving by three witnesses the infamous threat he had made.

I mention this to show the kind of vicissitudes we passed through in those days, and which Dr. Crouse, in his wisdom, is continually protecting us from, with a very small outlay of time and money.

I trust the time is not far distant when we as a profession will give a substantial recognition of our appreciation of our obligations to Dr. Crouse.

A vote of thanks was moved to Dr. Jack, and carried unanimously

Adjourned to banquet hall.

JOHN I. HART, D.D.S.,
Editor New York Odontological Society.

AMERICAN DENTAL ASSOCIATION.

August 6, 1891.—Third Day.—Afternoon Session.

THE election of officers for the ensuing year took place, with the following result:

President, W. W. Walker; First Vice-President, J. D. Patterson; Second Vice-President, S. C. G. Watkins; Corresponding Secretary, Fred. A. Levy; Recording Secretary, Geo. H. Cushing Treasurer, A. H. Fuller.

Executive Committee.—J. N. Crouse, G. W. McElhaney, V. H Jackson.

Place of meeting next year, Niagara Falls.

August 6, 1891.—Third Day.—Evening Session.

Reading of the minutes by the secretary, which were approved

Dr. Barrett read the report of the Committee on the President's

Address, and also the recommendations for changes in the constitution and by-laws.

Dr. Fillebrown offered the following, which was adopted:

"*Resolved*, That the Committee on the Revision of the Constitution be continued, and that any suggestions proposed by members, received by the committee within thirty days after the mailing of the report to members, may be incorporated in the final report, which will appear in the published *Transactions*, and such publication shall be deemed sufficient notice of proposed amendments, so that a vote may be taken upon them at the next annual meeting."

On motion of Dr. Taft, Drs. J. B. Rich and Corydon-Palmer, who have each been in practice for over fifty years, were made permanent members of the Association, without the payment of dues.

Dr. Smith.—Mention was made during the report of Section VI. that contributions would be called for to continue the work of examining prehistoric crania. The money has been exhausted, and the committee asks for an additional allowance of five hundred dollars. I would, therefore, make a motion to that effect.

This was adopted.

Dr. Ottofy moved that Section VI. be authorized to ask for contributions in money from the various State societies, to assist in the prosecution of this work.

Adopted.

Dr. Ottofy also moved that the transactions of the American Dental Association be sent to all societies that have already contributed, or will contribute, towards the prosecution of this investigation.

Adopted.

Dr. Taft, of the Committee on Necrology, reported on the death of Dr. William H. Atkinson. Drs. Fredericks, Horton, Barrett, Butler, Morgan, Crawford, Patterson, Stockton, Corydon-Palmer, and Dwinelle spoke in eulogistic terms of the deceased.

Report accepted.

Dr. Marshall moved that a committee of two be appointed to confer and co-operate with the other societies which are taking steps to perpetuate the memory of Dr. Atkinson.

Adopted.

SECTION III.—OPERATIVE DENTISTRY.

Dr. V. H. Jackson read a paper, entitled "Methods of Regulating Teeth," of which an abstract follows:

Since reading a paper before this Association some time since,

in which was described the system of using removable spring appliances, a number of methods have been used, some of which I will mention in my paper this evening. Only a portion of the alveolar process is developed until the teeth are fully erupted, and for this reason a slight pressure will change their position. Several methods were adopted with partial satisfaction for correcting irregularities of the teeth in young children, but none have been as successful as the crib.

Impression of irregularities are usually more satisfactory when taken with some of the compounds, as the surface of the model is more smooth than when taken in plaster, and is more agreeable to the patient. If the teeth are long, and there is danger of the compound dragging while being removed, a quantity of pulverized soapstone should be sifted over the surface before taking the impression.

If the second or third molar is inclined forward into the space formerly occupied by the first molar, the difficulty can be overcome by placing a rounded piece of soft compound between it and the next tooth, and allowing it to harden in such shape that there will be no undercuts. When well shaped and sufficiently hard, the impressions should be covered with one or two layers of paper, and then removed and placed together. If the operation is well performed, a perfect impression is the result. A little water injected under the lip will relieve the tendency to suction, and thus remove the danger of drawing the compound up in the centre, which often spoils the impression.

Since first referring to the system of retaining plates and cribs for regulating teeth, published in the *Dental Cosmos*, it has been constantly employed with various improvements. The models are first prepared by carving the plaster well away from the necks of the teeth that are selected as anchors. A piece of any metal suited to the purpose is formed to either or both the lingual or labial surfaces of the teeth. Very thin gold or German silver may be used. After the metal is cut to the proper form, it is contoured, which is made an easy task by using the contouring-pliers made by the S. S. White Dental Manufacturing Company. If the adjoining teeth are to be used as anchors, the metals are arranged on it and united. A spring wire, about No. 20, is then formed, as described in the previous paper in making the simple crib. The wire passes around the teeth, as the case may require, and is formed so it will fit the labial side of the tooth with both ends passing over the arch, resting on the metal described but should be made to fit loosely, so as not to injure the model when

emoving it. First bend the wire at right angles, like this [illus-rating], leaving the width between the parallel sides equal to the vidth of the tooth to be clasped. The part that is to clasp the neck of the tooth is then curved, so that it will be perfectly adapted to he labial side of the teeth.

Dr. Jackson then described the method in detail, showing numer-ous illustrations and charts.

About three years since it was observed that when copper was used in small quantity, in appliances that were retained for a long ime, there appeared to be no injury in the way of structural hanges or decomposition of food particles. The continued use of opper has proven its detersive properties. While relating the ad-vantage of using copper recently, Dr. Elliott, of Sag Harbor, exhib-ted a copper-plate that he was wearing, that has copper covering he portion of the rubber which would come in contact with the atural teeth. The teeth were extremely sensitive at one time, but e has suffered no inconvenience since using the copper.

The extraction of teeth that is so common, to prevent crowding, hould be discarded. If there is insufficient room for the eruption f the teeth, it is best to expand the arch, which is easily accom-lished by means of the crib. Correcting the position of irregular nferior incisors will often correct the position of the superior ncisors, if done while they are erupting.

Dr. Jackson, of Ann Arbor, Michigan, recommends to the profes-ion a spring wire crib attached to a plate passing over one or more eeth on either side of the arch, for retaining obturators, and thus voiding injury to the tooth-structure. (See *Journal of Dental Science*, ol. xi. p. 134.)

The advantage of the crib system for young patients is that it s easily retained and causes no inconvenience. The model is not njured in making the appliance, and is preserved as a record for uture measurements and study. The same method is also recom-nended in cases of fracture.

Dr. Jackson then gave a number of illustrations, and specified everal cases of his own which had been successful, and expressed he belief that the general adoption of this method could be antici-ated in the near future.

Dr. N. S. Hoff, as secretary of the section, read its regular report, f which an abstract also follows:

As even a brief synopsis of the work done would make the re-ort very lengthy, only a brief *résumé* will be presented. It is a act that the discussions which usually follow the reading of a

paper often transform an apparently indifferent paper into one of great value.

Probably the most notable contribution has been the series of papers contributed to the *Dental Cosmos* on the subject of "Management of the Enamel Margins," by Dr. Black. Another interesting paper, entitled "The Preparation of Teeth for Filling," was read at the Illinois State Society meeting by Dr. Noyes, and elicited a long and profitable discussion.

Papers by Drs. Wilson and Dwinelle caused interesting discussions in the New York Odontological Society on the subject of gold fillings, contour-fillings, etc. Dr. C. M. Gingrich presented a paper at the Maryland State Dental Society on "Cohesive Fillings." Dr. Ames read a paper at the Mississippi Valley Dental Society on the "Use of Copper Amalgam." Dr. Miller gave the result of his research in regard to oxyphosphate cements in the *Dental Cosmos* of January, 1891, and stated there that he is pleased to find that the subject of immediate root-filling is fast becoming one of the lost arts.

In the *Dental Cosmos* there is also to be found an article on "The Destruction of the Dental Pulp, and Methods of Treatment of Teeth discolored by its Retention in the Pulp-Chamber or Canal," by Dr. A. W. Harlan.

Dr. Kirk, in the July, 1891, number of the *Dental Cosmos*, recommends a new remedy (aristol), which is more agreeable to use than iodoform in pyorrhœa alveolaris, alveolar abscess, and as a dressing for root-canals.

The following books have also been published during the year: "Micro-Organisms of the Human Mouth," by Dr. W. D. Miller; "Compendium of Practical Dentistry," by B. H. Catching, D.D.S.; "A Compend of Dental Pathology," by George W. Warren; "Treatise on the Irregularities of the Human Teeth, and their Correction," by Dr. J. N. Farrar, M.D., D.D.S.; "Descriptive Anatomy of the Human Teeth," by G. V. Black, M.D., D.D.S.; "Dental Surgery and Pathology," by H. Sewill, M.R.C.S.

Dr. Custer read a report on the subject of obtundents and local anæsthetics used to obtund sensitive dentine, and mentioned several agents which are being widely used, the degrees at which they volatilize, and the effectiveness of each.

Adjourned.

ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.

The usual routine business having been transacted, the President, Dr. Louis Jack, presented the essayist of the evening, Dr. Edward C. Kirk, who gave as the subject of his remarks, "Alveolar Abscess."

(For Dr. Kirk's paper, see page 332.)

Dr. Darby.—The case related by Dr. Kirk is exceedingly interesting, and reminds me of one which came under my observation some years ago, and which, I regret to say, terminated fatally. It was that of a gentleman who was much run down in health and in an anæmic condition. He applied to have a broken-down central incisor cut off and an artificial crown grafted upon the root. I found, upon examination, that the pulp was living, and made the usual arsenical application to devitalize it. He called a day or two later, when the pulp was easily and entirely removed, and the root prepared for the crown. An antiseptic dressing was made to the root, and the following day the crown was set. Twenty-four hours later he complained of some soreness in the tooth, which I supposed would readily yield to the ordinary treatment. I saw no more of the gentleman until the following evening, when I was summoned by the family physician to his bedside. I found the patient unconscious, and a malignant alveolar abscess over the root of the tooth in question. I at once lanced and liberated the pus, which was abnormal in color and mingled with dark-colored blood. The patient was unquestionably suffering from pyohæmia. I learned the following day that he was no better, and the day following he died. His physician assured me that the abscess had been the cause of his death, and said that he would probably have died from the prick of a pin had the wound suppurated.

Ten or more years ago a lady called to have the roots of an inferior first molar removed. There was at the time an acute abscess at the apex of one of these roots. After removing one, she concluded that she would defer the extraction of the other. Ten days or two weeks later, I was asked to see her at her house. I found that she had continued to suffer pain, and that the abscess had not been arrested, but the pus had burrowed through the tissues of the neck and had seemed to be drawn by the poultices which she had used constantly lower and lower, until an opening had been made at a point opposite the arm-pit and nipple. It was with the greatest difficulty that she could open her mouth a quarter

of an inch. I succeeded in prying her jaws apart, and removed the other root of the offending molar. After a few days' treatment the discharge ceased and the patient recovered. She was a strong healthy woman at the beginning, but was much reduced in flesh and strength after this prolonged experience. Had she been anæmic like the first case mentioned, the termination might have been the same.

These are some of the terminations which are liable to occur from apparently simple cases of alveolar abscess.

Dr. Truman.—This subject is not one that can well be discussed, as it is simply a relation of facts. It is not a slight matter to have a tooth with alveolar abscess. I remember a case that came into my hands a number of years ago. The patient was taken with acute pericemental inflammation. Having been called out of town for some weeks, his physician attended him. The inflammation became very severe and extensive. What its character was I never learned, but death occurred before I returned. These cases are very unpleasant, as the dentist usually receives all the blame.

I could not quite understand Dr. Kirk's reason for performing an operation externally in the case described. I could not comprehend the necessity for it. If the mouth could be opened, why treat the case externally with poultices? Why not enter the pus-pocket by the mouth? It seems to me that that would have been the proper way. If I had had the treatment of that case, I should have applied cold applications externally, and ice to the jaw, and hot applications in the mouth, and performed the surgical operation there if it should have been required.

Many of these cases come to us after extraction. The relations of the periosteum and pericementum are so intimate that if one be affected the other is necessarily more or less disturbed, and the inflammation that leads to the formation of pus must, in many cases, be continuous. If the socket is closed with coagulated blood and not injected with antiseptics, I cannot understand how this trouble is to be prevented. It seems to me that to avoid these pathological conditions, the greatest care is required in the use of antiseptics after the extraction of teeth.

I criticise Dr. Kirk in the use of the words "laudable pus." There is no such thing as laudable pus; pus is never laudable. I also object to the idea that pus has a definite period for development. Diapedesis of the leucocytes begins very shortly after inflammation is aroused, and will continue to be a factor in the production of pus until normal conditions are established. The part

taken in this process by micro-organisms is not now under consideration.

Dr. J. D. Thomas.—There are one or two points in Dr. Kirk's statement of the case and in the discussion which impress me quite forcibly. You probably noticed in Dr. Kirk's case that the patient was evidently in a run-down, nervous condition; that his systemic tone was considerably reduced below normal. He did not present an anæmic appearance, yet constitutional conditions were such that violent inflammation or septic infection was bound to follow any exciting cause.

In his case it happened to be a tooth, but I believe the result would have been the same had he received the scratch of a pin upon any part of the body, or a bruise or injury of any other form.

In Dr. Darby's case the patient was in poor health and extremely anæmic. With such conditions there seems to be no limit to which septic infection may follow, either in the retention or removal of a diseased tooth. A member of my own family, while in a poor state of health, was attacked with pulpitis in the right superior second bicuspid, which was treated without success. As a result she lost every tooth back of the canine on that side, accompanied by a perforated antrum.

Fortunately, these extreme cases are very rare, particularly such as the case reported by Dr. Kirk and the one referred to by Dr. Darby; but it is no uncommon thing for inflammation to extend to the surrounding bone and soft tissues, even after the removal of the diseased tooth, resulting in the loss of one or two, or perhaps three, adjoining sound teeth, together with considerable process and bone.

In treating, I have had the best results by encouraging the formation of pus in the inflamed part with hot fomentations until relief from pain is obtained, after which, clearing the sockets of putrescent matter by using antiseptics and astringent lotions, insisting upon systemic treatment in the mean time by their family physician.

Dr. Jefferies.—I do not know that I have anything to offer. I have never had a case similar to Dr. Kirk's; but a good many years ago I remember one that, I think, was spoken of before at a meeting of this Society. Perhaps the circumstances attending it will bear repetition at this time; although it was not, strictly speaking, a case of abscess, it resulted in the death of the patient. It came from the treatment of an exposed nerve, and filling a root with gold, preparatory to putting in a crown-filling. The patient lived

in Wilmington. The dentist extracted the pulp and filled th root, leaving the crown for a future operation, and sent the patien home; and within twenty-four hours intense pain followed in an about the tooth. It grew so bad towards the evening of the nex day that he came to me and implored me to remove it, which, unde the circumstances, I did, as there was no possible chance of gettin the root-filling out to treat it. It was the next or the second da after that his family physician sent for me to go to his house an lance the gum, thinking there was inflammation, of which I sav no sign. Nevertheless, under his orders the gum was freely lanced I heard no more of the case until I heard of the man's death. Th physician was not of an investigating turn of mind, and I do no know exactly the immediate cause of death. It was evidently i some way connected with the treatment of that tooth. The phy sician's certificate, I believe, was that death occurred from conges tion of the brain.

Dr. Faught.—From my early practice I made it a rule not to le my desire to save teeth make me do what might result in a possibl fatal termination, where the patient gave evident signs of run down health, and in the treatment of cases in the lower jaw par ticularly.

I agree with Dr. Thomas in what he said as to the use o antiseptics. The treatment seems to be simply a treatment witl hot water. After extraction in these cases I always advise th use of hot water within the mouth, to bring about the constan stimulation and freest evacuation in the socket. I also long ag adopted the practice of never allowing a tooth to be extracte without having the patient report to me within the next few days, until I am sure all possible tendency to a dangerous resul disappears.

I condemn the insertion of any pledgets of cotton in the socket immediately after the extraction of teeth. The socket should b left freely open, and not have in it anything which will accumulat blood and interfere with the freest flow of pus. I have in many instances been obliged to remove pledgets of cotton put in by others and to the relief of the patient. I believe the recurrent trouble in almost every instance was due to cotton being packed in the cavity and interfering with the free evacuation of pus.

Dr. Rehfuss.—While the discussion has brought out many case and methods of treatment of various practitioners, still I do not believe that it has shaped itself towards the point that Dr. Kirk most desires, and for which he has brought the subject before us;

and that is, what is the duty of the dentist in these cases of alveolar abscess, where we have symptoms of possibly fatal results? All practitioners have cases where there is considerable difficulty in curing them; where possibly an abscess has assumed a chronic form. What the methods of treating are I am not taking into consideration. I cannot at present recall any of my own cases of this kind, but I can remember one of a physician. There was a patient of his who had trouble with a tooth, and in which an alveolar abscess caused septicæmia, and finally death. Now, the physician in this case should have called in the dentist. Dr. Kirk's subject has brought up this question: the duty of the dentist, and the duty of the physician in exceptional cases of this kind. The dentist, in treating a case of alveolar abscess, should follow out his methods in general, and when these constitutional symptoms become pronounced; when he can see or judge that septicæmia or some other condition unknown to him has set in, it is then unquestionably his duty to call some one in consultation who is familiar with diseases of this character. I think that is one point that Dr. Kirk has wished to bring out.

Dr. Head.—There has been a great deal said favoring the use of antiseptics after extraction. Whatever may be their value in such cases, I do not think it has been proven. The saliva is a great carrier of germs. No matter how often washes are applied to the socket of the tooth, the diluting saliva will follow, defeating all attempts at antisepsis. In fact, the experiments of Dr. Miller leave the question of their utility in decided doubt.

Dr. Truman.—I would like to ask Dr. Head what he would do in gingivitis. The ordinary saliva is constantly running in the mouth, and if he do not use an antiseptic there, I cannot see how he will treat it. There are various preparations that will destroy micro-organisms, and there are others which inhibit their growth. Take, for instance, hydro-naphthol or creolin. If proper solutions of either of these be used continuously, micro-organisms cannot develop in injurious numbers. Clinical experience has demonstrated this over and over again.

In answer to Dr. Thomas, I wish to say, I do not approve of cotton in the socket. I believe in cleaning it out and then treating it antiseptically. I am fully satisfied that all inflammations of the mouth should be treated in this way. I treated a case of necrosis involving the entire right superior maxilla for five months, and it originated from the extraction of a wisdom-tooth.

I can endorse Dr. Thomas's assertion that danger exists of alveolar

abscess extending to another tooth. I had an illustration of this that occurred in the clinic of the University this winter. It was that of a young girl, very anæmic, in which the teeth were separated by rubber. The result was inflammation and alveolar abscess in the lateral tooth; it extended to the canine, and, when I saw it, necrosis had taken place. To what extent this went I am not informed, as the patient passed into other hands.

Dr. Faught.—There is one sentiment in my mind that I would like to express. It is one in which I have secured statistics with a view to preparing a paper.

A person applies to a dentist with a cavity to be filled; the patient thinks of nothing but a plug to go into the cavity, and all surrounding conditions are entirely lost sight of. It simply reduces itself to a mechanical operation. We get the same idea too frequently, I think, in regard to alveolar abscess. I am speaking of the acute form.

The sentiment is simply this: That to my mind alveolar abscess belongs to that class of surgical operations best treated at the home of the patient, and that the dentist should become a visitant until acute symptoms have abated, and that systemic conditions should never be omitted in its treatment when purely local treatment is not meeting the requirements of the case. We too often look only to local treatment. I think we ought to relegate this acute form to the room and bed, where the case can be managed by visitation.

Dr. Thomas.—Dr. Kirk calls attention to the efficacy of phénol sodique. I agree with him in its applicability to cases after extraction. It is one of the best antiseptic remedies we have; but in cases of acute periostitis, where the pain continues for some hours after extraction, its use is contra-indicated, and hot fomentations are the more desirable. After the inflammation has reached its height and is at a stand-still, then by washing the cavity and applying a loose pledget of cotton saturated with phénol, you have, to my mind, the best means of rapid recovery extant.

Dr. Jack.—I have not had a case similar to the one Dr. Kirk has referred to. I would only express caution when serious peridental inflammation occurs in the lower maxilla, and would call especial attention to the danger in cases of purulent inflammation connected with the inferior wisdom-tooth.

It may be known to some of you that a few years since there happened a case, in the upper part of Philadelphia, of the death of a patient under the care of a physician, where the cause of death

vas assumed to be tonsillitis, but it was found, as the result of he autopsy, that the death was due to the occurrence of abscess f the inferior wisdom-tooth, the result of which was the infil- ration of tissues at the base of the tongue. The pus had bur- owed along the course of the muscles, and had very freely infil- rated the tissues and the hyoid bone with pus. The patient died f pyæmia.

In my experience a case occurred of a prominent clergyman vho came to me with inflammation of a lower wisdom-tooth, and t had a very unpleasant appearance and was already threatening, s I thought, to burrow along the mylo-hyoid. I said to him, "This ooth should be removed;" but he was a man of determined dispo- ition, and said he would not have it out. In the course of a few lays his physician sent for me and wished me to visit the patient. When I arrived at the patient's house I found extreme evidence hat there was infiltration of pus. I said that the tooth should be emoved at once. The response was that the condition of the atient was such that it would be dangerous to health and life to ttempt it under the circumstances. My response was that if the ooth was not quickly extracted, the most disastrous consequences night ensue. The tooth was removed, and I may state to you hat the patient was confined to his bed for some six weeks. The hysician treated him for a conditon similar to pyæmia.

I only cite this case, not that it bears any direct resemblance to hose given, but to state my view that in cases of severe inflam- nation of the peridental membrane of the lower wisdom-tooth, it hould be extracted at the earliest possible moment after the ab- cess condition becomes indicated.

Dr. McQuillan.—I would like to ask this question: How long are we warranted in treating a devitalized tooth, particularly those hat have blind abscesses? We have all had experience in filling eeth, and dismissing patients and telling them they can go for ix months, and having them come back the next day; and the uestion has come to me, How long are we warranted in treating hese teeth when it is impossible to get a fistulous opening, and fter the tooth is filled is it necessary to remove the filling to con- inue the treatment? It seems to me, particularly in the case of he lower molars, that at times I am running great risk in con- inuing very long treatment.

Dr. Kirk.—I would like, if I may be allowed, to give a word of xplanation at this point that I hope will serve to direct the trend f the discussion on this subject. I omitted a full description of

what was done when the patient returned after the extraction of the tooth. The omission was accidental. I washed out the socket with water; I did sterilize it as fully as I knew how, but not with corrosive sublimate; I used carbolic acid in full strength. I did endeavor to evacuate the pus through the bottom socket by passing a sharp-pointed instrument down as far as I dared. I stated in the description, I think, that the jaw was unusually deep. There was a distance of an inch or an inch and a quarter between the upper border of the alveolar ridge and the free lower border of the body of the maxilla. This accumulation of material, whether pus or not, was situated on a line immediately below the socket of the sixth-year molar and upon the border of the bone. If I had waited to carry out the treatment such as Dr. Truman suggests, and which I would use in a majority of cases, I believe the patient would have died before an evacuation of the accumulated pus could be brought about within the mouth.

In speaking of laudable pus, I should have qualified it by saying, so-called laudable pus. I agree with Dr. Truman, that there is in a certain sense no such thing as laudable pus. I used the term in its popular sense, in order to make clear my description of the kind of pus referred to.

I would be glad if Dr. Truman had explained a little more fully just what constitutes pus. It is yet an open question. I have not a full and definite idea of what constitutes pus; but the diapedesis of leucocytes has been shown to be but one factor in its formation. Some source of irritation is needed to account for the diapedesis and I think almost all pathologists agree that it is generally the result of some infection.

The reason I did not operate from the inside was because it was clear to my mind, from a careful examination, that I could not establish a free evacuation of pus by that channel, and it was also evident that the condition with which I had to deal was one of those pathogenic infective inflammations which was likely to produce pyæmia. I was actuated by my desire to prevent the man from dying, and by the belief that, in order to avoid a possible fatal result, the inflammatory products should be evacuated as soon as possible.

The incisions made on the outside of the face in this case have healed up almost without a scar. They were made with a very sharp knife, and such an incision always makes but a slight scar. I believe I materially shortened the course of the disease, if I did not absolutely save the patient's life, by the operation as described

I brought a report of this case before the Society for two easons. I think we are inclined to group under the general erm, alveolar abscess, a number of diseases which are related nly by reason of their position, and which have the factor in ommon with many other acute inflammations, the resulting dis-harge of pus. But, I judge, from the investigations of Dr. Miller nd others who have written upon the subject, that it is time that e recognized that there is a difference in these diseases. Alveolar bscess is a general term. I take it for granted that we have all f us read enough on this subject to warrant us in concluding that he character of inflammatory action is determined largely by the ature of the germs which produce it. One of the diseases which have outlined to you this evening is what is known, when it ccurs apart from the jaws, as phlegmonous inflammation. It is n inflammation which is closely related to erysipelas, and is a quite ifferent disorder from ordinary alveolar abscess, and is frequently tal, as shown by the number of cases that are reported by Dr. Miller in the reprint from the *Dental Cosmos* which I have distrib-ted. I have had these reprints made for this purpose simply ecause I was interested in getting an expression from the mem-ers of this Society on this very important subject.

I firmly believe that if I had not carried out the treatment in his case upon general surgical principles, I would have lost my atient. It was not alone because the patient was run down that his particular form of abscess occurred, but largely because of the pecific nature of the infection.

As to cotton, I would like to say one word in favor of it. Of ourse, plain cotton may and does, inside of a few hours, become an fectious mass. My use of it was simply as a vehicle for retaining ntiseptics in contact with the wound. If the socket is left open, he next time you wash it out you will have a collection of food *ebris* in a state of decomposition, which, to my mind, is much ore offensive than that of cotton-pledgets properly saturated ith some antiseptic. With regard to suitable antiseptics, we have hénol sodique. Without attempting to give a scientific explana-on, I know, from practical experience, that nothing I have used as acted so kindly as an application to the sockets, after the xtraction of teeth, as this agent. I do not approve of leaving otton-dressings in the sockets for an indefinite time; therefore, he patient is given directions to remove it. If not able to do o, he is directed to come back to me, to have the socket re-ressed in a similar manner, until healing is well established.

Under such treatment I get better results than where a simple mouth-wash is used. By the means of cotton-pledgets I bring the antiseptic into close contact with the tissues I wish to sterilize.

HARVARD ODONTOLOGICAL SOCIETY.

At the regular monthly meeting, held November 19, 1891, the President, Dr. Stanton, introduced the essayist of the evening, Dr. C. P. Briggs, of Boston, who read a paper entitled "Odontalgia."

(For Dr. Briggs's paper, see page 338.)

The discussion which followed was opened by Dr. E. C. Briggs, who said,—

As a contribution to the literature on this subject, the paper seems to be quite complete.

The question of diagnosis of toothache in the majority of cases is very simple, but we all have difficult presentations, and it is then that our knowledge is called upon, and sometimes it requires all we have to place the trouble where it belongs.

I have had examples of all the different cases that have been mentioned here to-night. In the closing up of the paper I noticed reference to the systemic diseases. I had a very interesting example of this variety recently. The patient was subject to rheumatic gout. He came with toothache, violent and agonizing. I felt helpless because I could do nothing to relieve; fortunately for me, the gout went to the back and left the tooth, and I escaped from making any mistakes.

I suppose all of us have had the experience of trouble with the second bicuspid resulting from the wisdom-tooth. I have met with it so often, that when a patient comes to me with pain in the superior second bicuspid, I immediately look at the lower wisdom-tooth on that side. Of course, I take a casual glance perhaps at the tooth itself, to see if it has any palpable sign of decay; but if it is not very evident that there is trouble there, I at once examine the lower wisdom-tooth.

In my experience with cases of diseases of the antrum, nothing pointed to the tooth as the cause. I remember being asked to examine a gentleman's mouth (by the throat specialist to whom he had gone for treatment) to see if there was any possible cause for

disease in the antrum, and it was only by very careful examination that I located the trouble in an apparently sound tooth, which, on investigation, proved to be pulpless, and the treatment through that cured the disease.

The value of the paper, of course, is to draw our attention to the fact that we must keep well in mind the various causes, for the reason that we are apt, especially when the patient does not complain of very decided pain, and we find the teeth apparently right, to pass it off lightly. There is a tendency to do that, and the patient goes on suffering, when, if we would look into it more carefully, we might relieve the pain by finding the cause and effecting a cure. This amply repays one for the trouble taken.

President Stanton.—I am sure there must be a vast amount of experience here in regard to toothache; to me certainly it is a question of immense interest,—for this reason: a great many cases that we get in our office result in neuralgia, and to my mind neuralgia is a disease that, in the future, will be treated by dentists as much as by physicians. I think you find to-day that half the cases of neuralgia in and about the head and neck and face can be cured by a skilful dentist and according to his diagnosis. Such treatment also brings into play an anatomical knowledge of all parts of the head, of the eye, of the ear, and of the nose. Many times patients are sent to us by physicians who have failed to find the exciting cause in the face or scalp, and, after a careful examination of the teeth, we find they are correct as far as we can go; but by quizzing the patient we can ascertain something that the physician has overlooked, and at once relieve the trouble. That such cases are not uncommon, I feel confident; therefore, I think it is our duty, as well as a professional advantage, to become thoroughly familiar with this disease. To the knowledge which we should possess as good dentists we should add that of the different organs of the head, and if we bear in mind the mutual relations of the teeth and these organs, we shall understand many cases of neuralgia and treat them successfully.

In commenting upon a paper of this kind, one will necessarily have in mind some particular case of interest. I will describe that of a young lady who had been in perfect health all her life,—had never been troubled with rheumatism or neuralgia, but when she was about twenty-five years of age, she was taken ill with typhoid fever, and this left her with neuralgia, which, at various times, centred in her eyes, teeth, and right side of her head. It was a typical case, for which physicians had done all they could.

She had been to an optician for examination, and had been fitted with several pairs of glasses. She came to me and complained of pain in the left superior second bicuspid. On examination, I found there a small cavity, very superficial, which I filled with gold. The pain continued; I removed the gold, replacing it with cement; still the pain remained. I destroyed the pulp of the tooth and removed it, this giving relief for a number of months. All this time she had this general neuralgia of the scalp and eyes. Finally, after careful examination, I discovered that her glasses were not just right. I urged her to go to an oculist and have her eyes examined properly and carefully, and she was partially relieved; at the same time she insisted on the removal of the second bicuspid. I then made no objection, because I thought that if by the removal of the second bicuspid any of her pain could be relieved, that would be an excuse. I must confess, too, that I was curious to find out what there was in or about this bicuspid that was the probable cause of the trouble. I removed the tooth, and, on breaking it, found there a nodule of cementum that had developed to a considerable extent and was enlarging at the time. Now, my opinion is that in the sensitive condition of the nerves of her head, this small nodule was sufficient to centre the neuralgia in that tooth. The last I knew, she was comparatively comfortable, and I attributed her relief to the fact that the exciting cause had been removed by extracting the second bicuspid, and by having glasses properly adjusted to her eyes.

Dr. Page.—I was recently called out of town to the case of a woman who had been in bed six weeks, suffering with neuralgia. There were exposures in the second molars of the left side, superior and inferior. In these two teeth I made the usual applications, and the neuralgia, which her physician considered beyond the dentist's ken, vanished apparently by magic.

On Saturday last a case of tumor of the left side of the neck came to me. After an examination, I made an opening through the crown of the left inferior third molar, pus coming up through the opening. The tumor was removed by the contents being pressed through that opening in the crown of the third molar.

An improper occlusion is a cause of toothache, which I frequently find. In order either to confirm or eliminate this as a cause, let the patient bite into modelling compound or wax. Make a model from that and study it.

In many troublesome cases I find that no operation is needed save that of correcting the occlusion.

Dr. Cooke.—I remember an example in a right upper second molar which was very lame on percussion. The patient said it had ached all the previous day and night. There was no decay, and it did not look as if the pulp were dead. I could see no reason why it should have caused all that trouble. The wisdom-tooth behind was through the gum,—it did not articulate with the lower teeth, but was in close contact with the second molar. The wisdom-tooth was extracted; the patient had no more trouble, and the evidence was quite conclusive that the slanting of the third molar, acting as a lever upon the second molar, was the cause of the trouble.

Dr. Grant.—I will mention two cases that came to me about two years ago of fractured bicuspids (first superior). They had ached and were exceedingly sensitive; drawing an excavator between the two cusps was excruciating.

I put a simple gold band around them, and the teeth have been used continuously since; but the point of the excavator at the fractured line produces as great a shock as when the fractures first took place.

Dr. Smith.—Did you carry this gold band up under the gum, or was it simply a ferule?

Dr. Grant.—Just a narrow ferule, perhaps three-sixteenths of an inch wide.

Dr. Smith.—Doesn't the patient have any pain during mastication, or at any time, except when you place the excavator in the fracture?

Dr. Grant.—None whatever.

Dr. Smith.—The relation of cases is wise, I think, inasmuch as it adds to the sum-total of our experience, and gives us the opportunity of profiting by that of others. I had a case where the patient (male) had been treated by a physician, who had also called in another physician to assist him in his diagnosis. This patient had suffered for two weeks before I saw the case with severe neuralgia on the right side of his face, extending down the neck. He said he had "suffered the tortures of the damned," and I fancy he had, until finally the physician advised him to come to me in the hope that I might be able to relieve him. The mouth presented this appearance: The wisdom-tooth, the mesial portion of it, was struggling to get through; the second molar had an approximal mesial filling of cement, not very large; the sixth-year molar had been extracted. While the physicians hardly believed that the neuralgia came from his teeth, yet they thought possibly the erupting wisdom-tooth might be sufficient cause, and

they had lanced that thoroughly and well. After talking with the patient some time, I concluded that the possible trouble was a pulp-stone in the second molar. I explained to him my suspicion, and advised him to have the cement filling removed and see what we could find. The filling was removed; I drilled carefully into the pulp-cavity and found there a little nodule of secondary dentine. It was detached, so it acted like a shot, resting right on the cornua of the pulp. I removed it and dressed the cavity. The patient came in the next Monday and thanked me very heartily for the relief he experienced. He said that Sunday night was the first night of rest he had had for two weeks, although receiving the combined skill of two physicians.

I had another case which was not exactly a case in practice, as it came to my notice through meeting on the street an acquaintance. She related to me her sufferings for six months, at frequent intervals, with terrible neuralgia of the shoulder, going down to the forearm. I asked her if her teeth had been examined, and she said that they had never been suspected by her physician as the cause of the trouble. I suggested that they might be, whereupon she called at my office. After a careful examination I found under the free margin of the gum, on the buccal side of the wisdom tooth, a cavity that penetrated to the pulp-chamber. It was such a difficult place to get at, and she had suffered so long, that I advised her to have it out, and after the extraction of that tooth the neuralgia disappeared from the shoulder.

I have seen other cases of neuralgia where apparently a very slight thing caused it all. I remember one case of a patient suffering with intense neuralgia, where there were no cavities in the teeth, except what had been well filled, but there was a noticeable recession of the gums, which I decided was the cause, from their hypersensitiveness. The exposed parts of the teeth were treated with a little nitrate of silver, which removed the sensitiveness and also the neuralgia.

I agree with you, Mr. President, that neuralgia has been of late, and will be in the future, more treated by dentists than formerly. One of our speakers has had all of his cases against the advice of physicians; many of mine have come to me by their advice. I speak of this as evidence that the physicians may be censured too severely. Elsewhere I think you will find, in most cases of neuralgia that are difficult of diagnosis, the patient is sent first to the dentist; and, in view of this, I think it is for our advantage, as you suggest, Mr. President, to be well informed on this

ıbject, as by so doing we may not only reflect credit upon ourselves, ut become of greater service to the human race.

Dr. Page.—I have spoken to you several times of a patient in- ıne from toothache, the teeth apparently perfectly sound. Three mes at intervals of about two years I have removed a pulp-stone. ı each instance it has taken an hour or more to locate it. The at- ıcks have been repeated four times altogether. In the first par- xysm he was so violent that it was necessary to strap him to the ed. The trouble then subsided without the cause being found. he second time the physician questioned me in regard to what I ıought of it, and as a result, the patient was brought to my office a carriage. After an hour's search for the cause, I made an pplication of arsenic, removed the pulp, treated the tooth, filled , and he has the tooth to-day. About two years afterwards he as attacked in the same way and was again brought to my office, ıe trouble being on the opposite side, and was treated with like ıccess. Two years afterwards he was again brought to me and gain successfully treated. In every case the trouble was in the ıolar teeth, and in each instance relief was obtained inside of venty-four hours. The patient is a man six feet one or two inches height; not fat, but heavily built; his teeth are of the kind sub- ect to pulp-stones,—very hard, short, and very yellow in color; ıe bucco-lingual diameter is greater than usual; the length of rown is shorter; the mesio-distal diameter is longer than usual, ıd they were considerably worn,—that is, the cusps were worn to ıe dentine. He grinds his teeth a great deal during sleep.

Dr. Stoddard.—I had a case that interested me greatly, from the ct that I was the patient myself. About the time of eruption of y wisdom-teeth, I had severe pain in the articulation of the ferior maxillary; sometimes the joint became so stiff that it would ith difficulty close. The teeth were perfectly sound at the time, ıd I thought it due to neuralgia from eruption of the wisdom- eth. Since that time I have seen a number of cases where per- ctly sound wisdom-teeth have caused neuralgia at the period of uption, although with not exactly those symptoms.

Dr. Page.—A year ago two very similar cases were sent to me a physician. In the first one he said he feared lockjaw, and ished me to make an examination. The teeth were completely ɔsed, and we did not dare to open them. In passing a probe ɔng the side of the teeth, I came to the right inferior wisdom- oth, and by the assistance of the physician, I pressed the cheek t and found what I thought was the edge of the gum over the

wisdom-tooth. I took a platinum probe and passed it in there, a large amount of pus flowing out. I then passed in one end of a platinum tube (used in a syringe), tying the other end around a molar.

In a few days I removed pus enough to open the teeth, and found the third molar erupting in such a way that in biting, the right superior third molar pressed the gum over it, causing irritation and swelling, and this, together with the food fermenting there, resulted in suppuration. I removed part of the gum, used full strength aromatic sulphuric acid, gave a quantity to take home, with instructions how to use. The tissues healed, and the wisdom-tooth has since come through.

I have had cases similar to those described by Dr. Grant, and account for them in this way: a person bites something hard on the right side; the wedge-shaped cusps of the bicuspids on the left side strike each other; in the shock they are split apart, the noise at the time misleads, and one does not notice when it is done. It may also happen where one grinds his teeth while sleeping, one of the teeth occluding improperly.

I will cite one more case, that of a man, a wood-carver, who grated his teeth while sleeping to such a degree as to be *painfully* near neuralgia. I tried to evolve some scheme to mitigate the evil, finally devising a vulcanite covering to fit over both the upper and lower sets, armed with smooth surfaces.

He could put these on and grind away all night with no adverse results.

Dr. Grant.—How do you treat those cases of fractured teeth?

Dr. Page.—Make an arsenious acid application, remove the pulp, band, and fill the tooth.

HENRY L. UPHAM, D.M.D.,
Editor Harvard Odontological Society.

CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY.

REGULAR meeting, Monday evening, October 19, 1891, in the dining-parlors of S. & J. Davis, Broad Street, Newark. The President, Dr. C. W. F. Holbrook, in the chair.

The roll was called by the secretary.

On motion of Dr. Levy, the regular order of business and the

reading of the minutes was dispensed with until after the reading of the papers.

T. Y. Sutphen, M.D., then considered the subject he desired to bring before the Association, that of "The Use of the Eyes in Dentistry."

By the use of a model the construction of a normal eye was explained; how the muscle of accommodation altered the convexity of the lens by its contraction; and, stating the fact that the eye was comparatively at rest when adapted for long distance, and that the greatest muscular effort was found in focussing upon near objects, he gave a comprehensive explanation of far-sightedness and near-sightedness; that the former was due to an eye being too short, and allowing only distinct vision by a considerable effort, and so compensating for the shortened antero-posterior focal length; and the latter due to the eyeball being too long, thus bringing the focal point anterior to the surface of the retina, the perceptive membrane. He explained the correction of these errors by suitable glasses,—near-sightedness requiring a concave lens to scatter the rays of light, carrying the focal point farther back; while just the opposite glass, a convex one, was required in a far-sighted eye to bring the rays of light to a focus quicker, and in this way overcoming the short antero-posterior diameter, at the same time relieving the muscle of accommodation. The doctor referred to the error of refraction called astigmatism, and showed how this was due, not so much to any error in the length of the eyeball as to the scattering of a portion of the rays of light, while the greater proportion focussed properly. He spoke of the advantage of a near-sighted eye over a normal one, enabling the man who might be moderately near-sighted to do his work close by without glasses long after the age of forty-five. The action of the muscles of motion was described, and their importance was enlarged upon as a factor in bringing about astigmatic errors. Attention was directed to the influence an abnormal eye would have in giving a dentist discomfort, and advised the use of suitable corrective glasses where errors of refraction existed. Caution was given in the matter of overwork and too long hours, and advised frequent rest by leaving close work for a few moments. It was the opinion of the speaker that a north light was the best, and east light came next in value; and he suggested that the dentist should do as the oculist does,—bring his operating-chair up close to a window with the hangings removed, and where a good, even skylight might fall directly upon the point of operation. The doctor brought up

the point of the value of artificial light in dental work, and thought it might be advisable to employ such illumination, providing the natural light was insufficient.

The President.—Gentlemen, this interesting subject is now open for discussion.

Dr. Sutphen.—I would like to have some of the gentlemen who have used artificial light express their opinion as to whether it is at all practical in dental surgery.

Dr. Ottolengui.—Mr. President, I was a little surprised that the essayist should have asked that question, because it was the one that I had in my mind to ask him to tell us about. A friend of mine bought a stomatoscope, and he told me he was going to make about double as much money in a year with it as he was making before, because he could work at night and on dark days, and later in the winter-time when the days are short. He had the stomatoscope about four months, and used it a great deal. I had an appointment with him one night which he did not keep, and the next day I received a note from him that he was very ill. I found him in bed, with an oculist attending him, and he was there about six weeks. The doctor ordered him to stop the use of the stomatoscope. In the mean time he had induced a friend to buy the instrument. He had a different kind; he bought it in England, and I suppose for that reason it was better. After having it about three months, he began to be troubled at night with insomnia, caused by constant pain in his head, which would occur after he had been asleep a few hours. He went from physician to physician, until some one told him to go to an oculist; and that oculist cured him with glasses, and the abandonment of the stomatoscope. That is the experience of two friends of mine with this instrument; and, while I regret their experience, I am very glad they had it before I bought mine, as I was just then on the point of doing.

Dr. Sanger.—Mr. President, I did own a stomatoscope; I do not own it now. As a part of my experience, I had to consult an oculist and now I wear glasses. Whether the stomatoscope had anything to do with that or not, I do not know; but I think that the experience of other gentlemen who have tried to use artificial light will bear me out in the statement that no honest workman can do himself justice under it. A man who places himself under that unnatural strain, and risks his physical health for the small stipend that may be added to his income, shortens the days of usefulness for his eyes, if not the days of his own life. Therefore, I am utterly and

ntirely opposed to artificial light; and the brighter the light the nore dangerous it is, because of the deep shadows which naturally ollow.

I was much interested in the doctor's remarks, and I wish they ad gone further for my instruction in the use and abuse of the eyes. t throws out a hint in regard to our attitude towards our patients. We are in the habit of standing beside the patient; yet I believe hat it is good practice to place ourselves, as frequently as possible, nearly in front, because I believe we can do better work in that osition. The use of the mirror in operations in the mouth I regard s bad, and should be avoided as much as possible. I think I have eard men boast that they could work with equal facility by look- ng into a mirror. I cannot, and what is more, I do not propose to ry to learn how to do it, because I feel that in learning I would njure my eyes.

I think the doctor's hint is a valuable one, that artificial light hould not be used, and for one I wish to emphasize it.

Dr. Sutphen.—My remarks concerning the use of artificial light y the dentist are from the stand-point of an oculist. We are lmost constantly using artificial light, and I know of no unfortu- nate experience in the use of it. I can see how much more con- tant and trying must be the dentist's use of the eyes than in our vork upon the eye or ear. It seems to me that the trouble which lentists find must not be so much in the use of artificial light as in the ong-continued application under these conditions. The continued ffort to see distinctly brings out the presence of refraction errors.

Dr. Osmun.—One point has not been touched upon. The oral avity being partly closed, and the hand being used in holding the nstrument, shows but a partial light at one side or the other, and here is constantly a shadow from the hand and the instrument; nd I think that is one reason why artificial light should not be sed in dental operations.

Dr. Stockton.—It is very true, that light, or rather sight, has as uch to do with good dental operations as the dexterity of the and; therefore it is very important that we take care of it, that we uard it in all the ways we can. I don't know whether Dr. Sut- hen has ever tried the use of bent glasses for modifying the light. was very sceptical about it. A gentleman told me that just as uch light would come through an opaque glass as one entirely ear. I have put in my operating-room that kind of a window, and have had a great deal more satisfaction in operating since than ever had before.

Dr. Ottolengui.—Will you explain that bent glass?

Dr. Stockton.—It is a rough glass, such as is used in conservatory windows. The sun may shine almost directly on it, and yet not affect the eyes. If any of you are contemplating building your residence to suit yourselves, you should put in the windows such glass as I have put in mine, and you will have no trouble with your eyes.

I had an experience with artificial light a short time ago. It was simply two globes filled with water, with a gas-jet between them and a reflector. The reflector passes the light through these balls of water, which, of course, they magnify somewhat.

Dr. Watkins.—Mr. President, the glass that the doctor has referred to is simply the glass as it is cast, without being polished.

Dr. Kingsley.—Mr. President, I thought that an oculist should know a great deal, and I came over here for the purpose of hearing it. It is supposed, generally, that the men who are engaged in a particular profession are familiar with the subject; an oculist should know all about the eyes, about the use and management of light for the benefit of the eyes; not the management of light so that it will bring the patient into the hands of the oculist and bring him a fee; but the management of light so that it will keep the patient out of his hands and keep his eyes good. I do not know but that our friend can give us some information on that.

A couple of years ago I built an office, and the question of light was a serious matter with me in this way: that while for more than a quarter of a century before, I had worked with a northern light, I was now obliged by the circumstances of the locality, which I could not control, to adopt a southern light; and the question in my mind was whether I was going to be better or worse off on that account. I consulted with some of my confrères, and I found that some of them who had used a south light all their professional days would not have any other, and those who had used a north light, and then had come to use a south light, preferred the southern light, saying simply that they thought it was more healthy to have the sun in your room. Now, before that period, I had worked with a southern light, and had been disturbed by having the light shut off frequently by passing clouds. In speaking of my own experience with the north light, with those who had continued the use of the south, I was told that it was a trifling matter that was hardly to be considered in connection with the grand advantage of a south light; so I was obliged to adopt it, and accepted the situation without further inquiry, and I have not had the di-

urbance with this light that I feared I might have. But this is what I wish to know: how much light do I want, or need? Do I want a large window, letting in all that can come from the sky, or do I want a little light thrown upon my work, as I have seen in a gentleman's office, so managed as to bring the light from the sky and throw it horizontally to the operating chair? I found that some who were boasting very much over their good light had windows cut up with heavy bars, that it seemed to me would cast shadows; or having a good-sized window with only one or two panes of glass in that window. So I have never come to any definite conclusion or satisfaction in my mind as to what is the better light, the kind, its position, and its quality.

I was particularly interested this summer when in Berlin. I was in the office of one of our most noted practitioners, and he had a small window,—that is, he had a portion of the window filled up with some panes of stained glass; then the paper on the walls and the adornments of his room were very dark, with heavy hangings, and the room was filled with bric-a-brac and dark objects; yet it was his operating-room. When he dismissed the patient and gave up the rest of the day to me, I said to him, "How about your light here? Do you have all the light you want?" "Oh, yes," he said; "an abundance. You see I have this light concentrated. I don't have a great flood of light in my room, but just a small amount, and it comes right down exactly where I want it."

Now, in another office the dentist informed me he could not bear such a thing as that, because the dark objects absorbed the light. He wanted light paper, light walls, everything light about him. So, although I have been forty years practising dentistry, I don't know much about this branch of the subject, and it seems to me that our oculist ought to tell us something about the true science of the thing,—whether we want dark rooms and a concentrated light, or whether a light room and all the light we can get into them; whether we would see better out of doors, or at the extreme end of a contracted aperture.

Dr. Faught.—The particular point that leads me to speak to-night is a remark of the gentleman in reference to the use of the microscope. I have had some experience in that, and I think that one of the things which microscopists soon learn is that, while we want illumination, there is also a possibility of obtaining too much light. We learn to avoid bright illumination except in those cases where a particular negative is used, and to use neutral tints and a controlled light. I think the experience gained there is probably

applicable to the use of light by dentists. I believe there is a possibility of getting more than is actually needed. We require thorough illumination, but more than that I believe to be injurious to the eye, and less than that equally injurious.

The gentleman who opened the subject stated that a north light was the best, and that the next best was an east light. I would like to have him inform us why he considers an eastern light next in value to a northern light.

Dr. Sutphen.—I think it is a generally-accepted fact that a north light is the best, because the direct sunlight does not reach the operating-room from that direction; the east light must come next in turn, on account of the time being shorter for direct rays from the sun during a dentist's working-hours.

Dr. Watkins.—Mr. President, I think that, as a rule, the dentists, unlike the physicians, get to work before the sun is high in the heavens; and therefore for two or three hours in the morning the east light would be very trying to work with. I consider this the poorest light, for the reason that in the morning it is very glaring. It is more trying to my eyes than a south light in the middle of the day. I think that from the north is preferable for dentists, because it is more even. This is at all times in the day just about the same. If we could have a constant south light, without clouds to obscure it, then I think I should prefer it, on account of its intensity. I like a very strong light. I have in my office a direct north light and a direct south light, and a skylight in each case. I think I have as fine a light as there is in America. I really think that a north light is the easiest on the eye; and, if I were going to build another office, I think I would have my principal office facing the north, with a skylight. Then you avoid having to depend upon curtains to regulate the rays, as you do with the south light. By having a set of curtains of different widths, they can be so arranged as to have the light come exactly where you want it at any time.

Dr. Stockton.—Mr. President, I would be glad to have Dr. Sutphen answer the pertinent question of Dr. Kingsley.

Dr. Sutphen.—I presume Dr. Kingsley meant to be complimentary when he called me an expert, but I really could not answer his question more definitely than in my remarks. I think it is a question to be answered by the personal experience of dentists themselves. As oculists, we do not strive to get a diffused light, but rather an even light from the sky, bringing our patients where a good strong skylight pours upon the point of operation.

Dr. Kingsley's statement that he had found so many men who used very different forms of light, and who were all satisfied with what they were using, was interesting but not at all satisfying to an inquiring mind. It would rather tend to prove that the chief point was to get intensity of light upon the point of operation, regardless of surrounding conditions.

Dr. Meeker.—Mr. President, I use both north and south lights, but I like the north best. I think that is the easiest on my eyes. It is only within a year or so that I have used glasses, and I find that I have to use them after working by a south light. I did use a stomatoscope about one month. I sold it after the second month was over, and I shall never again do any work at night. I fear I hurt my eyes by trying to do it.

Dr. Adelberg.—Mr. President, this is a sort of experience-meeting. I am somewhat over forty-five years of age, and I have never used a north or a south light in my office-work. For some six years I used a west light, and for nearly eight years an east light. So far I have no occasion to use glasses. It may be because I am ambidextrous, and can work at both sides of my chair. Dr. Sutphen told us that continued looking to one side was injurious to the eyes; therefore working alternately on each side of the chair may be conducive to keeping the sight good.

Dr. Luckey.—Mr. President, I simply want to add my voice of warning to those who may be disposed to use artificial light. I have been very much interested in the experiences of the gentlemen as they have given them forth, and I was surprised by the statement of the essayist that oculists, who work very much with artificial light, have not noticed any defects of their eyesight. Every dentist who has spoken to-night, without exception, I think, has admitted that artificial light was injurious. Why it is so I am not well enough versed in physics to say. Whether it is because the rays of light in the artificial light are not the same as they are in the natural light, I do not know, but I think probably that it is an explanation; that a clear natural light, containing all the rays of the speculum, is not so tiresome to the eye as an artificial light. But this I know from my experience, and also from the testimony of others, that one hour of work with artificial light is more straining to the eyes, and causes greater weariness and exhaustion, than two hours of work with a natural light. I was induced to buy a stomatoscope some years ago, and I tried it faithfully for a number of months. I found that my eyes were beginning to trouble me, and I discontinued its use. I did not sell it; I stowed it away as a me-

mento of one of my mistakes. I want to add my voice to the voices of the others who have spoken, in warning to those who may feel disposed to enlarge their incomes or get ahead more rapidly by using an artificial light, not to do so.

Dr. Sutphen.—Mr. President, I have very little to say, in closing this discussion, except that the subject of the practicability of artificial light has been so well ventilated that it seems to have been brought much nearer to a final conclusion than by anything said by myself. Still, it would be better to use artificial light rather than poor daylight. I think it is a safe proposition that one should not use artificial light, unless he is obliged to, but I do not see how it can be especially injurious in itself. The long-continued use of it might injure the eyes by leading the operator to overwork.

INCIDENTS OF PRACTICE.

Dr. Osmun.—Mr. President, in the placing of artificial lower dentures in the mouth, I presume every one present who has had experience with them will admit that it is somewhat difficult at times to get a lower plate to remain in place. I know of no better way to present this fact to you in a concise manner than to relate a case where I accomplished the object I set out to do, and how I did it.

About two years ago a patient came to me to have an upper and lower denture fitted. I never saw a more unpromising mouth. It was as flat as flat could be. In the lower jaw there was no ridge whatever. The party had been in the hands of two or three gentlemen who are skilful dentists, and there had been made a number of plates of different kinds,—aluminum plates, electro-deposit plates and so on; and they were all beautifully made, and accurately adjusted and occluded, so far as I was able to discover; but they would not stay in place. I took an upper and a lower impression and laid them one side. While I was thinking about what I should do in the case, I was walking along the street one day and I saw some boys playing with suckers on the sidewalk, were pieces of leather attached to a string; and I said to myself, if I could get a flexible surface to those plates, I believe they would adhere. I wrote a note to Dr. Kingsley and asked him to send me over some pieces of velum, or soft rubber. This came through a suggestion of Dr. Van Woert. I made a lower plate as we usually do, lining it with soft rubber. The adhesion of the upper plate was very defective; but the lower one which I made was perfectly firm. I then prepared a new upper plate, and lined it with velum, with a like good result. The upper one is worn in the mouth till the presen

day ; the lower one I made over again for reasons which I will state further on.

I told my friends, Dr. Sanger and Dr. Fisher, about this case, and asked them to try this method. They will tell you their experience.

When I packed the plate, I dissolved some ordinary rubber in chloroform ; coated the model, and then placed on the soft rubber. I found that this way left hard places, little particles of rubber vulcanized hard. Then some soft rubber was taken and dissolved, and used to fasten the velum on the model, and it did much better. I only covered the inside with the soft rubber, leaving a sort of ridge around the outside of the plate to finish. I found that the soft rubber left a little too much hard rubber on the outside, that cut down into the soft tissues. The lower plate was made over again, lining the entire under surface. I packed it first with a piece of blotting-paper, in order to get the thickness; then packed with rubber as we usually do. The finishing was difficult. It was rough, and uncomfortable to be worn. A disk was placed in the dental engine, and revolved rapidly, trimming down the plate until perfectly smooth.

The plate is not as clean as a hard-rubber plate, and it is only in those cases where it is exceedingly difficult to retain a lower plate that I would recommend its use. You must impress upon the patient the necessity of keeping the plate clean. And it is not as durable as a hard-rubber plate. But I think we are justified in using such plates in mouths of persons unable to wear anything else. This patient had had no comfort for some years. I have used this style of plate in perhaps half a dozen cases, and in every case it has been worn with satisfaction.

In upper dentures you sometimes find that you can retain them in this way. Try this method of lining the plate when nothing else will do. Sometimes in partial cases you find the rubber plate will rub the teeth ; and in such cases if you place a little velum or soft rubber around the teeth on the plate, it will act as a spring or sponge and hold it very nicely. There are many ways that will be suggested to you as you use it. The plate has to be made a little thicker when the soft-rubber lining is used, to compensate for loss of strength.

Dr. Sanger.—I tried the plan of Dr. Osmun in regard to the use of velum. Dr. Kingsley kindly favored me with some soft rubber, and also gave me his advice. He said the soft rubber had been tried before; but I found, on further inquiry, that the process

used, as I understand it, was to line the edges of the plate with soft rubber, forming a rim of velum and leaving the centre hard. After learning of Dr. Osmun's experiments, I made a plate for a patient in a case where I had great difficulty, making the entire surface of soft rubber. She has worn that ever since with a great deal of comfort. I judge it is over a year since I made it. She was in to see me about two months ago, and it then looked perfectly good. I can recommend this kind of plate to the gentlemen present who have not tried it. In making it you want to be careful to fasten the soft rubber down to the model, so that it will not let any portion of the hard rubber through, because if that occurs it will irritate the mouth severely. I advised my patient before I made the plate that it was an experiment, and she took it with that understanding. She has been very much pleased with the result. Probably Dr. Kingsley could give us some valuable details in regard to the working of soft rubber in this way.

Dr. Osmun.—In regard to fastening the soft rubber down, I have abandoned that method, and packed something else in first,—as blotting-paper,—then put on my soft rubber.

Dr. Fish.—Mr. President, about a year and a half ago I was struggling very hard with an exceedingly flat lower ridge, when one evening I happened to meet Dr. Osmun, and he told me about this soft rubber. I then proceeded to take my impression, and followed his instructions, with the exception that I used a soft rubber solution in chloroform to fasten the soft rubber to the plate, taking care not to have any surplus of hard rubber to crowd this out of place. After that plate was inserted in the mouth I could not dislodge it by pulling it directly upward. The plate gave the greatest satisfaction, and has, to the best of my knowledge, continued so. The mouth was exceedingly tender, and the ridge was completely absorbed. The lady had had nearly a dozen plates made in different parts of the country. I have made since that some half a dozen, and all of them are giving the best satisfaction.

In regard to soft rubber for partial dentures, I had a case that illustrated how it could be used to advantage. You know that we sometimes have patients where two or three teeth are standing at an inclination of forty-five degrees, and the plate has to be cut away in order to get it down on the ridge, and when it is down it is constantly moving. I had a case where the two canines were the only teeth remaining in the jaw, and they were inclined towards each other at an angle of about forty-five degrees, so that when the plate was cut away enough to come down on the ridge it was very

difficult to keep in place. I simply filled in a little soft rubber and vulcanized it, and that plate has been worn a little over a year without trouble, and is as tight as it was when it was put in. This soft rubber is not as lasting as hard rubber, yet if it wears for a year or a year and a half without showing any depreciation, we may expect it to wear three or four years. I am using at the present time, and find my best success with, Dougherty's soft rubber.

Dr. Richards.—I had a case similar to Dr. Osmun's, with very flat, hard ridge. The patient had had two cases made, and they fitted very well for hard-rubber plates; but it was very difficult for her to masticate her food. I made a plate of this kind, which overcame the difficulty, and I have used it four or five times with perfect success. I had great difficulty at first in learning how to pack it, but I think I have overcome this now.

Dr. Kingsley.—Mr. President, unless these gentlemen insist upon the term "velum rubber," I would ask the stenographer to substitute the words soft rubber. It is not velum rubber simply, because some rubber has been used to make artificial vela.

I am not familiar with Dougherty's rubber; I presume there is color in it.

A voice.—It is red.

Dr. Kingsley.—It is objectionable. Rubber that has color in it is objectionable, and the more color there is in it the worse it is for the purpose. The very best rubber for elastic purposes that can be made contains about five per cent. of sulphur and ninety-five per cent. of the purest and best Para rubber that can be obtained. If you want to turn the color a little from black, you can add a little vermilion, not more than five per cent. In this Doughterty's rubber I should judge there was as much as twenty per cent. of coloring-matter added to it, to give it its bright color. The manufacturer evidently thinks that those that use the rubber want it colored; color means more foreign matter, and the less durable is the work. There is no special object in having a particular color; the patient does not care anything about that.

I was wondering how these gentlemen were using the soft rubber, until I inferred, from what was said, that they were vulcanizing it, in connection with hard rubber, at 320° of heat, or thereabout.

Dr. Osmun.—I use it both ways. I vulcanize at from 200° to 300°.

Dr. Kingsley.—My associate yesterday let his heater run up to 280° or 290°, in vulcanizing some soft rubber, and I told him he had spoiled the work. The best results are obtained with soft

rubber by not heating above 260°; and it wants to be vulcanized from four to five hours, beginning at 240°, and running slowly up to 260°, and allowing it to remain two hours at 260°. In that way you get it very satisfactory. You cannot vulcanize hard rubber and soft rubber together at the same time and get the best results. The heat may be run up to 300°, but the work will be far less durable, will not last as long, and will be less elastic; nevertheless, it is very much better than a hard surface. The trouble that you had in trimming it up and getting a smooth surface was because of lack of experience. To get the best surface, it should be vulcanized on metal. The making of lower teeth is a little more work, I grant, but it is better. Have your cast made of tin or pipe-metal, and have it polished smooth with pumice-stone, and then vulcanize on that, and you will have a beautiful surface, as fine and smooth as glass. If the edges spread out, or if you have feather edges, take your scissors and trim the edge off to the shape you want; then take a hot instrument, and run it over the edge. That will leave a partly-melted surface, which is bad, but that is remedied by taking a rag, dipping it in chloroform, and rubbing it over the surface.

There are circumstances in which it would be inconvenient to vulcanize the hard rubber at 320°, and then subsequently attach the soft rubber and run the heat up to only 260°, but in these you can vulcanize as you have done. It will not absolutely spoil the soft rubber to run the heat up to 320°, but it injures it. If it were not for the hard rubber, it would be rotten and worthless, and it would be an imposition to give it to a patient.

Dr. Watkins.—I would like to ask Dr. Kingsley if he could not vulcanize soft rubber as well on a plaster model, by covering it with No. 60 tin-foil, as on a metal die.

Dr. Kingsley.—Yes; if the tin will hold its smooth metallic surface so that the thing will peel off from it.

Dr. Watkins.—I can vulcanize that way constantly hard rubber, and the tin retains its polished surface, so I do not have to polish the plate.

The subject was then passed.

Editorial.

ENGLISH CRITICISM.

THE quotations made under the heading of "Selections," from the March number of the *British Journal of Dental Science*, will doubtless be read with interest by those not familiar with English criticisms. It is usually a very excellent rule to permit letter-writers in journals to express their feelings on any given subject and maintain a dignified silence as the most fitting reply. The present instance seems to require attention, not so much from the intrinsic value of the communications as their representative character.

They are but another evidence of the jealous feeling, not yet obliterated from the professional mind in any country, and which must be regarded by men of broad views as a serious detriment to progress.

The criticisms made by Dr. W. Mitchell, of London, and published in the January issue of this journal, it is unnecessary to quote here *in extenso*, but we give the paragraph which seems to have aroused the ire of the dental fraternity in England.

"American dental colleges, like almost all other earthly institutions, are open to improvement, and I have no doubt but their progressive superiority will be demonstrated in the future, as it has undoubtedly been in the past, continuing to furnish the pattern that is so poorly copied on this side, and which, I am sorry to say, at present is more of a cheap burlesque than a worthy replica; and while ridicule and poverty-stricken wit has taken the place of argument and logic in the European press, the fact remains that more bogus diplomas are held and more questionable means resorted to to obtain legitimate degrees by men on this side of the Atlantic than upon the other, and had it not been for the European market these diploma-mills would have died a natural death."

While these expressions are severe, they do not seem to warrant the bitter onslaught made in the responses. The deans of all the colleges of England seem to have arisen as one man to repel the charge that American colleges are in most respects better than those they represent. With this we have nothing to do, neither have we personal knowledge sufficient to formulate an opinion. Comparison between schools of the same country, as well as those

of widely different nationalities, must always be liable to error, from the fact that, unless there is an intimate acquaintance with details, not possible to an outsider, the conclusion arrived at will be imperfect.

Had the criticism quoted been made by an American writer, it is safe to presume no notice would have been taken of it, for, as "S." says in his letter, "Mr. W. Mitchell . . . is a member of the British Dental Association and of the Odontological Society of Great Britain. It is *this fact alone*, of course, *which lends the least importance to Mr. Mitchell's writings.*" (Italics ours.) The inference of this is obvious, that Mr. Mitchell has given expression to knowledge obtained through intimate relations with the best elements of English dentistry.

It cannot be regarded of vital importance whether English schools are better or worse than American. They serve the purpose of the profession there, and no doubt accomplish it to the satisfaction of all concerned. The American colleges, on the other hand, have equally endeavored to build up a system of their own, adapted to the peculiar environments of their own country. The development of this system has been accomplished under very trying circumstances,—prejudice at home, criticism from abroad, and fraudulent dealings in worthless diplomas, for which neither the colleges of the United States or the government were responsible. A sample of this kind of criticism we reproduce here from the journal alluded to: "When all *our questionable means* to secure a diploma of one of *our own colleges*, which, after all, we are told, is only, well, 'a cheap burlesque,' has failed, Brother Jonathan receives us with open arms, and for a few dollars grants us a genuine bogus article."

This unfounded statement is but a repetition of much that has been published on the Continent; and when Dr. Mitchell says "that more bogus diplomas are held and more questionable mears resorted to to obtain legitimate degrees" by men in Europe than in this country, he simply states an absolute truth.

The experience of the writer through the most serious period of the "bogus-diploma business" led to the conviction that this nefarious trade was conducted in this country through agents in Europe, and that it was for a time impossible to procure a specimen of these fraudulent issues on this side of the Atlantic to be used as evidence. In an active personal search in Philadelphia at one period for legal proof, not a single diploma could be secured, and but one person found who held one. The then mayor of Philadelphia

nformed the writer that he had made every effort, through his olice force, to secure one, and failed. At this same period Europe vas being flooded with them. It is needless to say—as it is a natter of history—that the evidence was eventually secured, and he orginal, too, of this infamous business was imprisoned, and inally died. His bad work has been taken up by others, and rom some mysterious source these fraudulent productions are still ent to Europe, or, what is more likely to be the case, manufac-ured there.

It is also one of the experiences that letters are constantly being eceived, as they have been for a score of years, asking for diplomas *n absentia*, and while these applications have not been confined to ny particular country in Europe, they have come in greater pro-ortion from Germany. During the same period there have been ut few received from citizens of the United States, and none at ll for the past six years. It is absolutely impossible now, with ur present stringent laws, for one to practise under such a docu-nent, and we believe this to be equally true of England.

The assertion is made by one of the correspondents (Kosmos) hat "the engrossing topic in dental circles of repute is how to aise the quality of the teaching in American schools so as to ssimilate it to the British standard." This is evidently based on efective information. The National Association of Dental Facul-ies represents the entire teaching-force in the United States and anada, and from this body all proposed changes must originate. o such proposition has ever been before it, nor has the idea ever een suggested that schools under their jurisdiction should be made conform to the English standard. The question has been raised s to the propriety of increasing the requirements for entrance,—ot in accordance with the English idea, but to a standard consist-nt with American experience and progress. In this matter each ountry must be governed by its peculiar conditions, and in this irection criticism has no place. Indeed, the feeling of many well-ducated men in dental and medical circles is that a very high stand-rd for preliminary examinations is a mistake. This opinion has epeatedly been confirmed in dental teaching, and it has been demon-rated, over and over again, that the man educated in all that the igher literary colleges can bestow has no special advantage over he one of a common-school education; and oftentimes is found cking in those qualities that go to make the practical professional an.

That which seems to trouble the writer quoted is the fact that

Dr. Mitchell states that "the best and most progressive students, after completing their course on this side (Europe), . . . seek the halls of learning in America." Exactly why this should trouble our brethren in England is a problem, unless it be ascribed to an envious feeling of the work here. We are not aware that it is a common practice for persons to leave Great Britain for this country to secure a dental education; but we have had personal acquaintance with many who have been on this side to take *post-graduate courses* in various institutions. It seems that this should indicate a superior degree of intelligence, a desire to broaden the knowledge already obtained by interchanging experiences with others; and by no course of reasoning can it be construed into a reflection of the training previously received. These men have invariably been of high character, and whether they have gained much or little here, they have left a most excellent impression on the dental fraternity, and their presence has aided in correcting ideas in regard to dental education abroad.

What is true of England is equally true of Europe generally. These students do not come for the diploma, for that to them is of but little value, but to acquire other modes of practice peculiar, it may be, to this country. For the same reason, large numbers of educated men, literary, scientific, and professional, leave America and seek the schools of Europe. The man who refuses to remain locked up in narrow ideas, whether these be generated in the United States, Great Britain, or Europe, is one who takes the best possible course to secure a larger intelligence and ability to practise any of the callings of interest in the world.

Criticism such as this is, therefore, out of place; but if it must be adopted, we would kindly suggest to our English confrères that vituperation does not constitute an elevated standard of English writing from the stand-point of American intelligence, nor is it ever likely to command the thoughtful respect of their co-laborers in other lands.

AMERICAN DENTAL ASSOCIATION.

Special attention is called to the notice of the Executive Committee of this Association on another page. This is a timely request, and it is hoped that all who contemplate writing papers will comply with it, and prepare their essays in duplicate, as desired. It would be better if four type-written copies were made, instead

of two. This does not involve much extra trouble or expense, and would save much unnecessary anxiety on the part of the secretary.

It is well known that the leading journals all desire to make abstracts, and it is to the interest of the Association that its proceedings should have the widest circulation. To do this with one copy presented is impossible, and at previous meetings this has been a constant source of annoyance. Very few, it is imagined, are aware of the labor involved in preparing a report such as has appeared in the INTERNATIONAL DENTAL JOURNAL from month to month; and when it is considered that abstracts must be made and discussions reported during the sessions of the meeting, the request cannot seem an unreasonable one. It is hoped that the secretary of each section will enforce this by a special notice.

Current News.

DENTAL SOCIETY OF THE STATE OF NEW YORK.

THE Twenty-fourth Annual Meeting of the above Society will be held in the Y. M. C. A. Building, Albany, Wednesday and Thursday, May 11 and 12, commencing promptly at 10 o'clock, in the forenoon of the first day.

ESSAYS TO BE READ.

"Dental Erosions and the Gouty Diathesis. Are they usually associated?" By Edwin T. Darby, D.D.S.

"Treatment of Irregularities of the Teeth." By Eugene S. Talbot, D.D.S.

"The Herbst Method of treating Exposed Pulps." By C. F. W. Bödecker, D.D.S.

"Electricity: Its Application in Dental Science." By Albert Carter Westlake, D.D.S.

The following distinguished members of the profession are to take part in the discussion, and will positively be in attendance:

Dr. A. C. Northrop, Dr. S. Y. Perry, Dr. E. C. Kirk, Dr. Daniel N. McQuillan, Dr. John D. Thomas, Dr. R. B. Winder, Dr. M. W. Foster, Dr. L. D. Shepard, Dr. J. N. Farrar, Dr. V. H. Jackson, Dr. Frank Abbott, Dr. L. Ashley Faught, Dr. W. C. Barrett, Dr. C. E. Francis, Dr. William H. Dwinelle, Dr. R. R. Andrews, Dr. Frank French, Dr. E. S. Gaylord, Dr. K. C. Gibson, Dr. C. N. Peirce,

Dr. S. H. Guilford, Dr. B. F. Luckey, Dr. F. H. Lee, Dr. Fred. A. Levy, Dr. W. W. Allport, Dr. S. C. G. Watkins, Dr. C. S. Stockton, Dr. E. A. Bogue, Dr. C. Heitzmann, Dr. W. G. A. Bonwill.

A. W. WALKER, *President.*
CHARLES S. BUTLER, *Secretary.*

AMERICAN DENTAL ASSOCIATION—SPECIAL NOTICE.

THOSE intending to present papers to the different sections of the Association, at the meeting to be held at Niagara, will aid very materially in the work if they will have duplicate type-written copies of the essays made. The labor and responsibility imposed upon the secretary of the Association by the demands of the various journals for abstracts has made this change a necessity, and it is especially urged that this request be complied with in all cases.

Signed by order of the Chairman of the Executive Committee.

C. N. PEIRCE,
Secretary.

UNION MEETING OF THE PENNSYLVANIA AND NEW JERSEY STATE DENTAL SOCIETIES.

THERE will be a joint union meeting of the Pennsylvania and New Jersey State Dental Societies held at Cresson Springs, Pa., on July 20, 21, and 22. We expect this to be one of the largest dental meetings ever held in this part of the country.

All who wish to give clinics at this meeting, which will be one of unusual interest, can communicate during April and May with

P. K. FILBERT, Pottsville, Pa.,
Chairman of Clinic Committee for Pa. Society.
S. C. G. WATKINS, Montclair, N. J.,
Chairman of Clinic Committee for N. J. Society.

ILLINOIS STATE DENTAL SOCIETY.

THE Twenty-eighth Annual Meeting of the Illinois State Dental Society will be held at Springfield, Ill., May 10 to 13, 1892. The State Board of Dental Examiners meet at the same time and place. The profession generally is cordially invited.

LOUIS OTTOFY,
Secretary.

70 DEARBORN STREET, CHICAGO.

CHICAGO DENTAL SOCIETY.

At the annual meeting of the Chicago Dental Society, held Tuesday evening, April 5, 1892, the following officers were elected for the ensuing year:

J. W. Wassall, President; Thos. L. Gilmer, First Vice-President; E. A. Royce, Second Vice-President; L. L. Davis, Recording Secretary; Geo. J. Dennis, Corresponding Secretary; E. D. Swain, Treasurer; J. H. Smyzer, Librarian.

Board of Directors.—G. H. Cushing, E. Noyes, and J. G. Reid.

Board of Censors.—A. H. Peck, B. D. Wikoff, and D. M. Gallis.

Geo. J. Dennis,
Corresponding Secretary.

PATENTS ISSUED.

A list of recent patents reported specially for the International Dental Journal:

470,184.—Dental Plugger. Edward Ebi, Cedar Rapids, Iowa. Filed October 25, 1890. Serial No. 369,290.

470,211.—Dental Mouth-Mirror. Robert F. Phillips, San Diego, Cal. Filed August 5, 1891. Serial No. 401,805.

470,332.—Artificial Tooth. Charles E. Friel, Boston, Mass. Assignor of one-half to Alfred H. Gilson, same place. Filed January 6, 1892. Serial No. 417,194.

470,670.—Dental Disk-Holder. F. F. Gilmore, Princeton, Ind. Assignor to the S. S. White Dental Manufacturing Company, Philadelphia, Pa. Filed July 1, 1891.

471,146.—Dental Engine. C. P. Shultz, New York, N. Y. Filed July 7, 1891.

AMERICAN MEDICAL ASSOCIATION.

SECTION OF ORAL AND DENTAL SURGERY.

The annual meeting of this Association will be held in Detroit, June 7, 8, 9, and 10.

The officers of the Section are: Professor J. Taft, Chairman; Eugene S. Talbot, Secretary.

The following essayists have promised to read papers:

Dr. J. Taft, Address; Dr. G. H. Gradle, Dr. G. S. Junkerman, Dr. John L. Gish, Dr. T. D. Crother, Dr. J. Smith Dodge, Dr. G.

Lenox Curtis, Dr. W. C. Barrett, Dr. M. H. Fletcher, Dr. E. S. Talbot, Dr. John S. Marshall, Dr. G. W. Weld.

EUGENE S. TALBOT,
Secretary.

125 STATE STREET, CHICAGO, ILL.

Selections.

ABSTRACTS FROM "THE JOURNAL OF THE BRITISH DENTAL ASSOCIATION," MARCH, 1892.

THE following selections have been made from the letters of several correspondents in relation to Dr. Mitchell's paper published in the January number of this journal.—ED.]

"TO THE EDITOR OF 'THE JOURNAL OF THE BRITISH DENTAL ASSOCIATION:'

"SIR,—Mr. Smith Turner has omitted to mention that Mr. W. Mitchell, about whose offensive effusion in the INTERNATIONAL DENTAL JOURNAL he writes, is a member of the British Dental Association and of the Odontological Society of Great Britain. It is this fact alone, of course, which lends the least importance to Mr. Mitchell's writings. Under the circumstances, I think the members of both those bodies are justified in calling upon Mr. Mitchell either to substantiate or to withdraw and apologize for the statements which he has ventured to put forth. First, there are only three dental journals published in this country. Will Mr. Mitchell give us one citation from either of these papers in which the 'value of (respectable) American degrees is questioned and ridiculed'? Secondly, there are three dental schools in London,—the Dental Hospital, National Dental Hospital, and Guy's Hospital. Will Mr. Mitchell, after discussing the qualifications of the teachers and the method of instruction carried out, give us the grounds upon which he bases the judgment that these schools are 'more of a cheap burlesque than a worthy replica' of American colleges? Thirdly, the number of leading men in this country who hold American degrees could be represented by the fingers of one hand. Will Mr. Mitchell, in face of this fact, give us the evidence upon which he founds the statements that 'the best and most progressive students seek the halls of learning in America to secure that which they were unable to obtain here'?" . . . S.

"To the Editor of 'The Journal of the British Dental Association:'

"Sir,—There is a tone of viciousness about Mr. W. Mitchell's communication to the International Dental Journal which cannot be passed over in silence, and, for the honor of the school I represent, I unhesitatingly pronounce his remarks to be absolutely false in word and in spirit. Considering that in all branches of science and art students visit continental schools, is it to be wondered at if dental students should follow a similar course? It would be a direct insult to the body of students who have graduated at our colleges were I to qualify them under the comparisons of good, better, best; but I can say that of those who have distinguished themselves most in their academic career not one has sought the American diploma. . . . Mr. Mitchell's sympathies with American dental colleges may be well meant, but I fail to see the origin of his enthusiasm, and certainly, if he desires to uphold the spirit of the journal he supports with his communication to advocate *international* dental education, he will fail by his unjust strictures on the merits of the English schools. All lovers of science are proud to acknowledge the work done in schools of honorable reputation, and long may it be before that feeling dies out. Mr. W. Mitchell would have done himself more credit had he made himself familiar with the internal working of our schools before he penned his unfortunate communication; as it is, I can only regard his remarks as the result of ignorance or personal pique. Apologizing for trespassing upon your valuable space,

"Yours very truly,

"F. Henri Weiss,

"*Dean of the National Dental College.*"

"To the Editor of 'The Journal of the British Dental Association:'

"Dear Sir,—In the last number of the *Journal*, Mr. Mitchell asks why the best English dental students go to America to complete their education?

"With some personal experience of English and American dental schools, I should say our best students stay at home, where they are quite as well instructed in technical knowledge and professional ethics.

"In short, Mr. Mitchell's assumption is, throughout, based on imagination.

"I am, dear sir,

"Yours faithfully,

"F. NEWLAND-PEDLEY, F.R.C.S., L.D.S.

"March 3, 1892."

"TO THE EDITOR OF 'THE JOURNAL OF THE BRITISH DENTAL ASSOCIATION:'

"SIR,—In an extract from an article by Mr. W. Mitchell, quoted by Mr. Smith Turner in your last issue, Mr. Mitchell asks, 'Why is it that the best and most progressive students, after completing their course on this side, and having learned all their instructors were capable of imparting to them here, seek the halls of learning in America?' etc.

"The answer is a very simple one. During the years I have been officially connected with the Dental Hospital of London, about two hundred and thirty students have been educated there, and received their diplomas from the Royal College of Surgeons; of these, not more than eight have gone to America, and certainly they were in no special sense, or indeed in any sense, the best and most progressive of our students. In one case, the student who came out top of the list of an American college at which he attended had been several times unsuccessful before obtaining his diploma in England.

"Mr. Mitchell, no doubt, will feel himself in honor bound to give similar publicity to the answer that he has already given to the question.

"MORTON SMALE,

"*Dean, Dental Hospital of London.*"

"TO THE EDITOR OF 'THE JOURNAL OF THE BRITISH DENTAL ASSOCIATION:'

"SIR,—On reading the extract from Mr. W. Mitchell's speech, with which you favored us in last month's *Journal*, my curiosity was awakened by the cock-sure audacity of his assertion, and I sought to test its accuracy by a reference to the 'Dentists' Register' for 1891.

"The result is as I expected. The statement is but another example of spread-eagleism, resulting from a limited knowledge

and a too persistent and exclusive association with co-patriot log-rollers. Had Mr. W. Mitchell kept his eyes open, and in a desire for truth made honest use of the opportunities placed within his reach by the very people whom it is his pleasure to decry and revile, and had he at the same time read with intelligence the dental literature of his own country, I think he would have crowed less loud and struck a truer key in estimating the comparative merits of British and transatlantic education, and the efficiency of their products. That our *best* students have gone, or do go, to finish in America, I have no hesitation in denying, and in proof thereof have but to quote the names of Tomes, Mummery, Smith Turner, Gartrell, Underwood, Parkinson, Hepburn, Hutchinson, Woodhouse, Smale, Lloyd Williams, and a whole host of others who, in point of head or hand, will hold their own with the best that ever an American college turned out. As for the rank and file, I am convinced from a pretty extensive intercourse with dentists in Britain and in America that, taking them *all round*, the British dentist is better trained for his life's work, and therefore more reliable, than his transatlantic brother. . . . That our system of education is more than a 'cheap burlesque' of his vaunted Alma Mater is shown by the fact that in America at present the engrossing topic in dental circles of repute is how to raise the quality of the teaching in American schools so as to assimilate it to the British standard. . . . We have had *much* good from America, Mr. W. Mitchell, *but not* ALL. A great deal even of that *much* has been taken from the old country and re-shipped,—an old friend with a new face. . . .

"KOSMOS.

"March, 1892."

"TO THE EDITOR OF 'THE JOURNAL OF THE BRITISH DENTAL ASSOCIATION:'

"SIR,—What ungrateful wretches we European dentists must be! When all our questionable means to secure a diploma of one of our own colleges,—which, after all, we are told, is only, well, 'a cheap burlesque,'—has failed, Brother Jonathan receives us with open arms, and for a few dollars grants us a genuine bogus article, and yet we dare question its value. Surely, sir, as Mr. Turner says, 'Comment is unnecessary.' Yet I think one statement should not be allowed to pass unanswered. The best of English students generally *are* satisfied with the curriculum here, and do not seek the 'halls of learning in America;' and the few I have come in con-

tact with who aspired to the American doctorate, have not proved themselves in practice to be in any way superior to their fellow-students who have been content with the teaching received in English schools.

"Yours truly,

"R. EDWARDS,

"*Dean of the Liverpool Dental Hospital.*

"LIVERPOOL, March 4, 1892."

ALCODIFORM[1] IN CAPPING NERVES.

IF the nerve is very much exposed, apply a ten-per-cent. solution of muriate of cocaine. Cut away part of the nerve and bleed it freely. After hemorrhage has ceased, cover the nerve with a thin coating of alcodiform. As soon as the alcohol has evaporated, cover this with a thin layer of chloro-percha, and as soon as the chloroform evaporates, flow over the gutta-percha some cement. After this cement hardens, add more cement. After cutting away excess of cement the cavity is ready for permanent filling. The cavity must be kept dry with dam during this process. If you get too much alcodiform on the nerve it can be reduced by touching it with a piece of bibulous paper saturated with alcohol. When the nerve is very slightly exposed, bleed freely, apply alcodiform, and cover with chloro-percha, leaving off the cement if you fill with an amalgam or any plastic filling.

S. M. JOHNSON,
Texas Dental Journal.

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[1] Iodoform with just enough alcohol to make a thick, creamy mass.

THE

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Original Communications.[1]

SHOCK AND COLLAPSE RESULTING FROM DENTAL OPERATIONS.[2]

BY JOHN S. MARSHALL, M.D., CHICAGO, ILL.

MR. PRESIDENT AND GENTLEMEN OF THE ODONTOLOGICAL SOCIETY OF NEW YORK,—When invited by the chairman of your Executive Committee, Dr. J. Morgan Howe, to prepare a paper for your society, I was for several days thereafter in the "slough of despond," from the fact that I despaired of finding a theme which had not already been worn threadbare by the numerous writers upon dental subjects. I was, moreover, ambitious to introduce a new subject; but failing in this, to present a few new thoughts upon some old topic, or, at least, a new application of some old principle.

I am indebted, at this time, for the suggestion of my subject to my colleague, Dr. Allport. The question is one which has not been so constantly before the profession as some others, and for this reason, I trust, will prove a more acceptable and interesting topic for discussion.

It is my purpose therefore to lay before you this evening a few thoughts upon "Shock and Collapse resulting from Dental Operations."

[1] The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

[2] Read at a meeting of the New York Odontological Society, March 15, 1892.

If, when I have finished, my critics find it necessary to amputate some unsightly excrescence, to probe to the bottom some deep-seated and foul-smelling ulceration, or possibly to extirpate the heart of the subject, I bespeak only that the scalpel be keen, and the hand that wields it steady. Anæsthetics may be omitted.

SHOCK.

Definition.—Shock is a good old Saxon word, meaning, to shake,—to shake with violence. As applied to medicine and surgery, it comprehends "sudden or instantaneous depression of organic, nervous, or vital power, often with more or less perturbation of body and mind, passing either into reaction or into fatal sinking; occasioned by the nature, severity, or extent of an injury, or by overwhelming moral calamity." (Copland, in Dunglison's "Medical Dictionary.") Another definition is as follows: "A condition of sudden depression of the whole functions of the body, due to powerful impressions upon the system by physical injury or mental emotion. Its more obvious manifestations are signs of lowered activity of the cardiac, respiratory, and sensorial functions; and reduction of surface temperature." (Sir William MacCormac, in Quain's "Dictionary of Medicine.")

COLLAPSE.

Definition.—Collapse comes from the Latin *Collapsus*, meaning, to fall together,—to fall in ruins. Medically, a general prostration or failure of the vital powers. "A complete prostration of strength, either at the commencement or in the progress of the disease." (Dunglison's "Medical Dictionary.") Another authority says, "Collapse is a state of nervous prostration. When it is extreme, the vital functions are in a condition of partial and, sometimes, nearly complete abeyance. It may terminate in death, or be followed by gradual reaction and complete recovery. . . . Collapse and shock have usually been classed together, but it is not accurate to do so. It is true that the ganglionic centres of the medulla oblongata are more or less profoundly involved in both, and that both possess many symptoms in common, dependent upon the derangement of function of one or more of these centres. Some confusion is attributable to the fact that shock is a term applied not only to a state or morbid condition, but to the cause which most frequently produces that condition,—a violent impression or 'shock' to the nervous centres. Collapse arises from many different causes, shock being one, of which collapse may be regarded

as a final and extreme degree, and into which it often imperceptibly passes.

"Collapse, on the other hand, may occur under conditions where there has been no antecedent state of shock. Collapse presupposes nervous exhaustion, while shock may instantly appear in a healthy individual." (Sir William MacCormac, in Quain's "Dictionary of Medicine.")

Shock, therefore, may appear instantaneously in healthy individuals, and is caused by fright, extreme mental emotion, accidental injury, or surgical operations; the depression of vital force being slight or severe according to the impression made upon the nerve-centres; the tendency being generally towards reactions, which may take place in a few minutes or not for several hours; while in extreme cases it may terminate fatally.

Collapse, on the other hand, generally manifests itself in persons who have undergone previous prolonged nervous strain which has caused exhaustion; the system is therefore at a disadvantage if called upon to sustain the debilitating effects of disease, or any of the accidental, emotional, or surgical conditions just mentioned. The depression of vital force is more prolonged and extreme, depending upon the strength of the individual and the character and severity of the exciting cause. Reaction sets in less quickly, and complete recovery may require weeks or months to be accomplished.

Collapse, in its most extreme form, following cholera, yellow fever, or shock from severe accident or surgical injury generally, proves fatal. Shock, with severe hemorrhage, often causes fatal collapse.

Prolonged and painful dental operations generally produce considerable depression, and in individuals already in a more or less exhausted condition from disease, overwork of mind or body, emotional causes, and occasionally in chlorotic girls, pregnant women, or those suffering from female complaints, and in frail and delicate children, they may produce alarming symptoms of collapse.

There is in the normal condition of the system a very great difference in the nervous excitability and physical endurance of individuals; while in the same persons under abnormal conditions the individual peculiarities are accentuated. All are less able to endure the shock of accidental or surgical injury, or the extremes of joy or grief, if the physical or mental conditions are below the normal.

It is, therefore, as much the duty of the dentist to look into the general conditions of the health of those who present themselves

for operations as it is for the surgeon to do so, before commencing any surgical procedure. Only in extreme cases, when immediate operation seems necessary, as the only chance of saving life, will the intelligent surgeon permit himself to operate upon individuals whose immediate physical condition,—as in shock and collapse,—or whose general health, is greatly impaired, without first making the attempt to recuperate the depressed vitality, and place the patient in the best possible condition for the operation. Failure to appreciate the necessity of such treatment tends to disappointment, or disaster of greater or less moment, either in the success of the operation, the after-effects upon the system, or the life of the patient.

There are but few dental diseases which *per se* are dangerous to life in otherwise healthy individuals, and few operations which can be considered as in any sense dangerous to the same class of persons; and yet the presence of an alveolar abscess or the extraction of a tooth occasionally proves fatal, either from septic infection, a peculiarity in diathesis, or some pre-existent morbid tendency which predisposes to a fatal termination.

On the other hand, painful or prolonged dental operations, like the preparation of a series of exceedingly sensitive cavities of decay, or restoring the contour of the teeth with gold, are very depressing and irritating to the nervous system.

Dr. Litch, in the "American System of Dentistry," vol. iii. p. 71, says, "Operations upon the teeth and associated tissues are often excruciatingly—and in certain conditions of the system dangerously—painful in character. That fatal results may follow such operations, in consequence of reflex impressions made through the fifth nerve upon vital ganglia, is a well-established fact."

The dentist is generally obliged to perform these operations without the benefit to his patient of any of the anæsthetics. The nature of the operations, the necessarily upright position of the patient, the considerable amount of time required to complete them, and the difficulties encountered in the maintenance of anæsthesia, preclude the use of these agents; consequently shock and collapse, in varied degrees, are often the sequel of the severe strain upon the nervous system to which the individual has been subjected. It is not at all uncommon—as I believe every careful observer before me will admit—for strong, robust men, even, to suffer from various symptoms of shock after sitting for two or three hours under the manipulations of the most careful and humane of our profession.

The means at the command of the dentist for the prevention or the mitigation of the suffering incident to dental operations are limited, and known to you all.

The following formulæ have proved very helpful in my practice in relieving the pain attendant upon the preparation of sensitive cavities of decay and preventing nervous exhaustion:

Croton chloral hydrate, grs. x;
Bourbon whiskey, ℥i.
Sig.—Twenty minutes before operating.

Morphia sulph., gr. ¼;
Bourbon whiskey, ℥i.
Sig.—Thirty minutes before operating.

Potassium bromide, grs. xx;
Cinnamon water, ℥ii.
Sig.—Thirty minutes before operating.

Potassium bromide, grs. x;
Croton chloral hydrate, grs. x;
Cinnamon water, ℥ii.
Sig.—Thirty minutes before operating.

A wise use of those constitutional remedies, supplemented with the local treatment usually employed, give material aid in relieving the suffering and nervous apprehension of the patient. And if coupled with an educated judgment and quick perception as to the general physical and mental conditions of those presenting themselves for dental operations, and the amount of fatigue and nervous irritation that they are likely to endure with safety, will do much to remove the dangers of such operations, resulting in shock or collapse.

We all have doubtless been more or less guilty of compelling our patients—through carelessness or ignorance of the laws governing the vital forces—to endure the fatigue of long and painful operations when they were by reason of their physical or mental condition, or both, unfit to bear them with impunity.

Children especially should not be compelled to submit to the fatigue and nervous strain of such operations, particularly during the period of rapid growth, puberty, and just preceding it, or while engaged in severe study. At these periods the nervous system is usually taxed to its utmost limit of endurance. When crowded beyond this point the health gives way; and often when too late it is discovered that the foundation has been laid for a train of nervous affections which persist until the end of life.

The practice of filling teeth with gold for children at these periods is, for other reasons than those just now under discussion, not wise, and doubly so when the present and future health of the child is placed in the balance.

The rapid movement of the teeth, by the various methods employed in orthodontia, is often a serious and dangerous operation, on account of the severe and constant irritating influences upon the nerve-centres.

It requires a well-informed mind and the exercise of a clear judgment in order to determine, many times, just what, how, and when this or that operation may be undertaken with safety to the health of the child. It would be much better to sacrifice the personal appearance to the general health; while, on the other hand, a year or two of schooling might be dispensed with for the sake of the personal appearance. In other words, it would be wisdom to choose health rather than beauty; while a year or two of rest for the child from school-work, to gain the necessary strength to endure the nervous irritation incident to so many cases in regulating the teeth, would be a small sacrifice to make to improve the personal appearance or to place the teeth in a better position to perform the functions for which they were created.

Chlorotic girls and women suffering from uterine and ovarian diseases in their manifold forms, and during gestation, or the functional changes which establish the menopause, are usually in a more or less exalted state of nervous irritability. The nerve-centres seem to be more easily impressed and reflex disturbances are common.

Dental operations of any kind are not well borne by such individuals; but if prolonged and painful in character, they should not be undertaken unless they can be performed through the agency of an anæsthetic or anodynes. In most cases it would be much better to adopt palliative and temporary measures until such time as the health is restored rather than by heroic treatment, to run the risk of nervous exhaustion or more serious consequences. Miscarriage and other serious troubles are not unheard-of *sequelæ* of heroic operations.

Shock from the extraction of teeth is often severe, sometimes inducing alarming symptoms. Syncope is the most common; but this is often followed by a decrease in the surface temperature, cold perspiration, feeble pulse, muscular tremor, nausea, and vomiting. In the more severe cases the depression may be so great as to cause a fatal termination.

Cases of death following the extraction of teeth under the influence of anæsthetics, and sometimes attributed to heart-disease,—fatty degeneration, dilatation, valvular disease, etc.,—are no doubt often the result of shock induced through the progress of the operation before the sensory nerves were completely paralyzed by the action of the anæsthetic. The fifth nerve is considered to be the most sensitive nerve of the body, and it is also among the last to yield to the influences of the anæsthetic drugs. The necessity, therefore, of complete anæsthesia in tooth-extraction, or in any other operation in which this nerve is painfully involved, is self-evident.

The anæsthetic drugs are administered to annihilate pain and prevent shock from the surgical injury; but if they are not carried to the point of profound impression or complete anæsthesia, the desired result is not obtained. The loss of mental consciousness is not anæsthesia, but this condition takes place before the sensory function of the fifth nerve is paralyzed. There is less danger to life in surgical operations from profound than from partial anæsthesia. Partial anæsthesia invites shock, while profound anæsthesia prevents it, as every surgeon and dentist of experience can attest.

Cases are on record, in considerable number, of persons who have died from shock superinduced by mental excitement,—fright, sudden joy, or some great sorrow, the dread of a surgical operation sometimes of even a trivial nature. In many of these cases there was evidence of a weakened condition of the system, most often associated with diseases of the heart.

Dr. George W. Gray, in the "Reference Hand-Book Medical Sciences," vol. vi. p. 439, says, "Lauder Brunton relates a remarkable case of sudden death from shock the result of mental emotion. Some medical students seized the janitor, who had displeased them, and made him believe they intended to behead him. They placed him before a block and blindfolded him, then struck him a sharp blow upon the back of the neck with a wet towel. On removing the bandage they were horrified to find that he was dead."

In the early years of my practice I often operated for individuals—when their time was limited—four, five, and even six hours at a sitting, with only an intermission of a few minutes for luncheon. Looking back upon it now, I cannot refrain from quoting, as applicable to the circumstances, the old familiar line, "Fools rush in where angels fear to tread."

Frequently after such prolonged sittings, particularly when the operations were large gold fillings, the patient has left the chair

completely exhausted, and sometimes fainted, presenting marked symptoms of shock, and requiring active measures for resuscitation; while in other cases they have been confined to the bed several days thereafter, from nervous exhaustion.

One case of this character occurred in my practice several years ago, and taught me a valuable lesson.

The history is briefly as follows: J. R., aged fifteen years, health good, but growing rapidly, was brought to me by his mother, three days before he must leave home for boarding school, with the request that his teeth be put in good order. After an examination, it was found that there was so much to be done that a week would be required, with sittings of from two to three hours each day to complete it. The mother insisted upon it being done in the given time, as he could not be late in entering his school. My better judgment was overruled and the work was done, the sitting averaged six hours per day. The boy left the office on the last day very much fatigued. Next day the father called to say that his son was quite ill, and seemed to be laboring under considerable nervous excitement; low nervous fever with great depression followed, which confined him to his bed for a little over four weeks, and he did not enter school until two months after the formal opening.

As further illustrations, I will relate very briefly three other cases from my own practice, one from that of a friend, and three others from the practice of my associate, Dr. Allport.

Mrs. C., aged forty-seven years, in fair health; apparently menopause not yet fully established. Has borne no children. Was operated upon three years ago for the treatment of a chronic alveolar abscess, of ten years standing, by extraction and replantation by the method described in a late number of the *Dental Cosmos*. No anæsthetic was used, as the patient objected to taking it. The operation was well borne, and the lady went home with instructions to return if the tooth gave any annoyance. She did not return. One week after the operation I was sent for, and found her in bed, looking pale and very much exhausted. Her family physician had been in daily attendance since the operation. When called he found her extremities cold, the pulse weak and accelerated, nausea and vomiting, and a very anxious expression of countenance. Restoratives were administered, and after a few hours these symptoms passed away. A low fever followed, from which she recovered slowly. Three months after the operation—which, by the way, was successful, the tooth reuniting with the alveolus without pain or soreness—she left her room for the first time.

The explanation is plain. The nervous system at the time of the operation was taxed to the full extent of endurance by the change taking place in the reproductive functions. The shock of the operation was "the last straw that broke the back" of an already exhausted nervous system. Prostration followed, from which recovery was slow on account of the functional changes which were taking place.

Mrs. L. T. E., a frail-looking, nervous woman, aged twenty-seven years, married five years, and has three living children, the youngest one year old. Health has been delicate since the birth of the last child. Was given a sitting recently for gold filling of one and one-half hours. She was exceedingly nervous and in great dread of the operation.

To obtund sensibility and to quiet the nervous condition the following was administered twenty minutes before operating:

Croton chloral hydrate, grs. x;
Bourbon whiskey, ℥i.
Sig.—Twenty minutes before the operation.

The patient left the office very much fatigued. On arriving home she immediately went to bed, where she was obliged to remain for four days suffering from nervous exhaustion. In this case the operation was not severe nor especially painful.

One-hour sittings for the introduction of plastic fillings have since this time been better borne, but considerable exhaustion followed. The chloral hydrate and whiskey are administered at each sitting, at the earnest request of the patient, and she declares she could not endure the pain without them.

Mr. L. E., a strong, robust-looking man, an operator upon the Chicago Board of Trade, aged fifty-two years, who had just passed through the excitement and anxiety of a corner in wheat in which he had lost heavily, was given a two hours' sitting for a large contour gold operation. On leaving the chair he complained of great depression and faintness. Stimulants were administered, and he soon recovered sufficiently to return home. He afterwards told me that he kept his bed for three days thereafter, being unable to rise on account of the extreme exhaustion.

Several years ago, in a city in central New York, a lady past fifty years of age called upon a professional friend for the extraction of an aching tooth. She was placed in the chair preparatory to the operation, when almost immediately she expired. The post-mortem examination revealed fatty degeneration of the heart.

The coroner's verdict was death from heart-disease, caused by fright. This is an exceptional case; but it illustrates the fact that shock is sometimes superinduced by mental excitement; and that it may under certain weakened conditions of the heart terminate in instant death.

The following cases are from the practice of Dr. Allport:

Mrs. B., aged thirty years, general health good. Pregnant for the fourth time. During each previous pregnancy one or more teeth needed attention, and invariably, when they have been filled with gold requiring extended sittings, nervous prostration has been great; several days being required to recover from it. At the last visit plastic fillings were inserted and the sittings shortened, as the past experience indicated that temporary treatment only was admissible. No prostration followed.

Miss M. G., aged seventeen years, physically frail and exceedingly nervous. Has been under his care since she was nine years old. Teeth very soft. Her record shows sixty-nine fillings have been inserted during this time, all of them a combination of tin and gold. The reasons for this line of treatment were, first, the great saving of fatigue and the nervous energy of the patient,—such fillings can be inserted in one-third of the time required for gold fillings,—and the greater preservative qualities of the combination of metals over gold alone. Had this child been compelled to endure the physical and nervous strain incident to so many gold operations, her health would in all probability have been permanently injured.

Mr. W. D., lawyer, aged fifty years. Strong and robust and of great physical endurance. Had been a regular patient for twenty-five years. Five years ago he was injured by his horse falling upon him, breaking the right femur and fracturing several ribs. The nervous shock was very great, and he never fully recovered from it. Before the accident he had always prided himself upon being able to endure any amount of physical suffering incident to dental operations without flinching. After the accident he was never able to endure a sitting of more than fifteen or twenty minutes long, while during the whole time perspiration would stand in great drops upon his forehead, and he would complain of suffering the most intense agony.

It was only possible to insert temporary fillings from this time until his death, which occurred about two years ago. The fatigue and prostration following even these short sittings was very considerable, and emphasizes the fact that the character of the opera-

tions must be tempered to the physical condition of each individual.

Several other marked cases could be recited if time would permit, but these are sufficient for the purposes of illustration.

In the foregoing pages I have endeavored to lay before you the various conditions of surgical shock and collapse, which occasionally result from operations, which to healthy and robust individuals may be of trivial moment, but in those of exalted nervous sensibility, or the physically or mentally overworked, or depressed, result in serious and possibly fatal consequences.

The prevention of such untoward results will depend very largely upon our ability to correctly diagnosticate the physical condition of each individual presenting himself for dental operations; to correctly judge as to the amount of fatigue and suffering each can endure without detriment to health; and the proper use of drugs and other means at our command to mitigate the suffering.

In conclusion let me call your attention to the operator himself.

The dentist of full practice is under a constant nervous and mental strain for from six to eight hours every day. The character of his work requires the closest application, and a skill of no mean degree; the eye must be clear, the hand steady, the brain unclouded. His sensibilities must be under control, his sympathies ready to be drawn upon at any moment to an unlimited extent, his patience must be inexhaustible, his physical endurance and nervous energy that of a Hercules.

I venture to say that the "wear and tear" upon the vital powers of a busy dentist is greater than that of any other class of professional men, the physician and surgeon not excepted. It is granted that the responsibilities which often compass the issues of life and death are much oftener borne by the physician and the surgeon than by the dentist; but, on the other hand, these responsibilities are not being constantly carried; while the difference in the character and surroundings of the cases under treatment gives variety to the work and in a certain sense lightens the load.

In the daily professional life of the dentist there is but little variety. He must perform the same monotonous round of operations, endure the same strain upon already overwrought nerves, the same draught upon his sympathies and patience, and the same tax upon his physical endurance. "'Tis the constant dripping that wears away the stone." Add to these the long hours of close confinement, the stooping positions with contracted chest, the breathing of the poisonous gases of the expired air, and the dangers from

disease-infection, and I ask, Is not such a life infinitely more taxing upon the vital energies than that of any other profession?

The fatigue which follows a day's labor, such as I have just indicated, must be experienced to be appreciated. Such labor, continued day after day and week after week, is very exhausting; the appetite fails, digestion and assimilation are impaired, the nerve-centres are disturbed, and unless rest is immediately taken, insomnia or complete nervous prostration is the result.

Some have attempted to recuperate the strength by the use of alcoholic stimulants; but this only places the evil day a few steps further into the future, while, if this course is pursued, the habit grows upon them, and when the final day of reckoning comes the misery is all the greater.

What we need is variety in occupation. I would therefore recommend every dentist to have a "hobby," and ride it well. He should also take frequent periods of recreation with rod or gun, horse or wheel, shell or yacht.

Get out into God's free air; drop all thought of your profession; leave the disagreeables behind you, and become for a little time a boy again!

A half-hour's rest after the mid-day meal is a good thing to indulge in, and if practised every day will prove of very great benefit. Such time is not lost, for with fresh energies more can be accomplished in the same length of time than with powers rendered weak by fatigue.

I fancy some of you are saying, "Don't you find it easier to preach than to practise?" Forsooth, I do! Yet occasionally I practise what I preach by breaking away, as upon this occasion, from my duties and responsibilities, to enjoy the good things of the world; not the least of which is the fellowship of my professional friends.

9 Jackson Street.

DESCRIPTION OF A CASE OF REGULATING.[1]

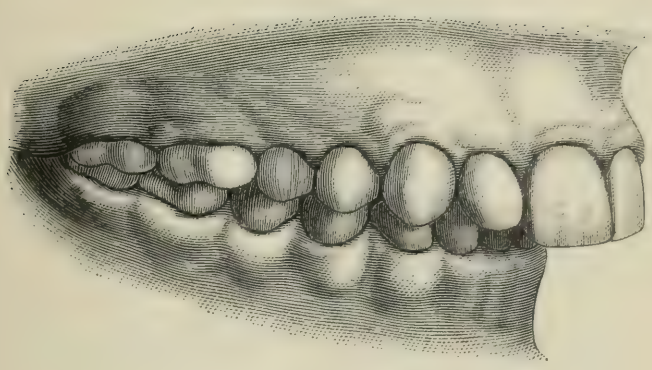
BY DR. H. F. HAMILTON, BOSTON.

The case I present to-night is a common one, but the treatment is, I think, new. The patient, a boy of thirteen, had the condition of teeth shown in model marked No. 1, taken December 1, 1885.

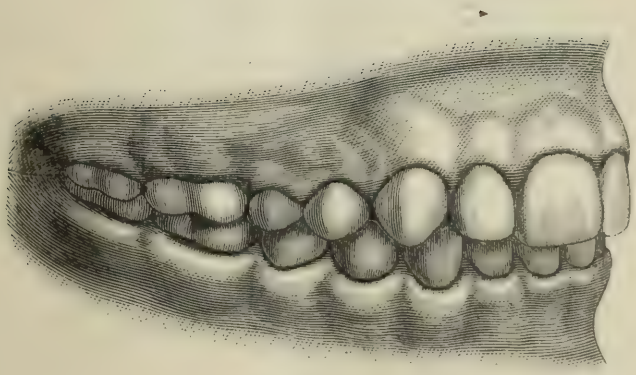
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[1] Read before the American Academy of Dental Science, January 6, 1892.

No. 1.



No. 2.



The lower jaw was receding, and the upper front teeth were so prominent as to prevent the easy closing of the lips, giving the face the weak expression characteristic of these cases.

Pulling in the upper front teeth would only improve the facial appearance slightly, so I determined to try throwing the whole lower jaw forward the diameter of a bicuspid. This I accomplished easily, so that in four months the condition was as shown in model No. 2.

You will understand what was done by noticing the articulation. In No. 1 the superior second bicuspid strikes in front of the inferior second bicuspid. In No. 2, you will notice, it strikes behind. The same change is, of course, shown with all the other bicuspids and molars.

It was finished nearly six years ago, and I have watched it carefully before reporting. The teeth have not changed, and the wonderful improvement then shown in the boy's appearance has increased, the face being now strong rather than weak.

The method used was simply a rubber plate fitting the roof of the mouth and over the bicuspids and first molars, where it was made thick, and with depressions to receive the cusps of the lower teeth. But these depressions, instead of being directly over the cusps, were slightly in front, so as to throw the lower jaw forward when closed, by the action, as it were, of a series of inclined planes.

A plate was made also for the lower jaw on the same plan, and worn alternately to keep the teeth in place, and to avoid the injury likely to come from long and continuous wearing of plates.

At the end of four months the second molars, not being covered by the plates, had grown together so as to articulate when the plate was in place, and the result of this change was that the patient could not close the teeth in the original manner. The changed position was the only comfortable one.

The plates were worn but little after this, nor were stay plates of any kind necessary.

This advance of the lower jaw comes, I think, from preventing the condyle going to its place; but there is a change going on at the angle of the jaw which will ultimately allow a perfect articulation.

This explanation is theoretical, and I should be glad of light on the subject.

A NEW ILLUMINATING METHOD BY THE USE OF ZIRCONITE.

BY DR. W. R. PATTON, COLOGNE, GERMANY.

GENTLEMEN,—I bring to your notice this, for us, new illuminating method, discovered or more properly worked out by Dr. Koch, Professor at the Bonn University, aided technically by the mechanician, Mr. Max Wolz, of the same place. I feel certain that I am introducing a means of great value to our particular specialty, for the various necessities which call for brilliant lighting effect. The inventive minds of our profession will rapidly develop its uses, and, by their facility of adapting ways to means, will undoubtedly lead to unforeseen advantages for its use in operative as well as for prosthetic dentistry.

My attention was attracted to this lighting method by a patient, a rising young medical practitioner, who had viewed and taken some interest in the ordinary reflecting petroleum lamp, the electric mouth-lamp made for our particular use; and I have consequently brought such an apparatus in order to demonstrate before you its powers, and in the hope of awakening your special interest to its peculiar worth and value. Everything necessary to explanation of this apparatus is from the papers of the discoverer, Dr. Koch, in the *Polytechnische Journal*, as well as from the *Pharmakologischen Institut* of Bonn. I feel assured of his satisfaction in my attempt to introduce to your notice the result of his research, which can be of such practical advantage to our specialty, and evade any future charge of plagiarism by acknowledging the fact beforehand. A few remarks relative to the production of light in general may not be taken amiss in order to verify the basis of this improvement and the causes which led to its development.

Since the introduction of the electrical arc light in illuminating technics, every means has been resorted to, and the powers of the inventor taxed to the utmost in the endeavor to heighten the light-effect of oils and gases, in order to at least approach the intensity of the electric. Great light-intensity, however, can only be arrived at through the corresponding high temperature of the light radiating body.

Solid bodies in darkness, at 400°, give but a weak light; a so-called dark-gray heat, at 600°, reaches a red heat, at 900° to 1000°, white heat,—whereas, gases even at 1500° to 2000° give no light,—at least not under ordinary circumstances. The flame temperature

the latter is consequently by introduction of air-combustion and the heating of the burning gases, considerably increased. The ame itself thus becomes shorter, clearer, and hotter, because the rning process takes place more rapidly and less cold air comes in ntact with the burning gases.

The glowing solid carbon in the gas or oil flame radiates from e hotter flame more light, and as in a smaller flame it is contracted to a smaller space the intensity of the light increases immensely.

The various regenerative lamps in use have (in this direction) ached all that is nigh posssible, but the light is, notwithstanding, ill so yellow in its character that it cannot yet compete with the ectric, which comparatively is the nearest to daylight in quality e have. From the preceding, one sees that for the production of tense white light, the hottest flame to get in connection with a lid glowing body, which is permanent in this temperature, must ive theoretically the most perfect gas-light.

The highest possible temperature on this earth, to be reached by hemical processes, is that of a carbonic oxide flame burning in pure xygen, and very near this point comes, under similar circumstances, e flames of hydrogen or coal-gas.

In past times such flames were much used for the production of he calcium light (Drummond's light) for light-house signalling and uilding purposes, and in the great American Civil War came into lay for illuminating the field of action at the siege of various forts, nd even now it is occasionally brought into requisition. Its use as encumbered with great drawbacks; the production of oxygen as costly and troublesome; the burners not appropriate, using o much gas; and in damp weather the lighting-body (pieces of ylindrical unslaked lime) fell to pieces, and on account of other disadvantages too numerous to mention, one particularly being the anufacture of the necessary oxygen very troublesome and exensive, its use was discontinued. Of later years, however, by the rection of factories for the production of oxygen, its use, parcularly in England, has again become more general. Still, as very lime-light, in consequence of the rapid wearing away of the ghting-body (lime), requires the permanent attention and regulting of an individual, its use is more restricted to illuminating fect for short periods of time, as on the stages of theatres and r projecting lights.

The lime-light is particularly advantageous, and has often been ade use of, in medical practice, for illuminating interior portions of e body, its high intensity and white light, by means of suitable

reflectors, making it possible to define the finest differences of colo
of the mucous membranes, and so be of appreciable value in th
diagnosis of disease in its various stages, which is impossible wit
the yellow oil or gas-light. As Dr. Koch, through some years o
practical use for medical purposes, was constantly annoyed by th
defects of the calcium-light, he was induced to experiment wit
zirconearth or *zirconite*, which finally led to the apparatus whic
will presently be exhibited and produced. *Zirconite* was discovere
by Klaproth at the end of the last century, but Berzelius was th
first to draw attention to the high power it possesses for emissio
of light. It is absolutely impossible to melt this *zirconite* by th
highest possible chemical production of heat known up to date. It
power consists in accordance with its chemical purity, and th
glow-body is manufactured by great pressure. Much experimentin
has taken place in connection with the preparation of the zirconit
body, but to Linnemann is accorded the credit of discovering tha
more success could be attained in manufacturing a burner for th
coal-gas and oxygen flame, so that with the least possible gas an
the least pressure the highest heat and light-effect could be se
cured. He demonstrated that the chemical union of both gase
should take place one-half to one centimetre in front of the burner
In other words, the flame should burn in front of the burner an
not at the burner. That this should constantly take place, th
efflux or emanation of the mixed gases must be greater than th
velocity of their explosion or the speed of their translation.

By a properly-constructed burner, the pressure of the oxyge
must be fifteen times greater than that of the coal-gas, then ther
will be found, about one centimetre in front of the mouth of th
burner, a light-blue, ball-shaped spot,—in reality the actual flame,—
which possesses the highest temperature or heat, and the metal o
the burner gets hardly warm, much less burnt on the point. If th
oxygen pressure is less, the flame strikes backward,—that is
commences funnel-shaped at the oxygen emission-points, is less hot
and heats the burner in a short time very strongly. If the flame
as stated, be properly formed, then the entire induced caloric is con
centrated at a small point some distance from the metal, and thu
can, without any loss of power, work with full effect on the glow
body.

The Linnemann burner, however, notwithstanding its valuabl
qualities, was and is not adapted to medical purposes on accoun
of its size and complexity, as well as its high cost. Credit i
due to Dr. Koch and the mechanician, Mr. Wolz,—to the firs

hrough his preparation of the zirconite body, as well as the in-roduction of the glass tubes, to which I will later refer, and to the tter for the manufacture of a suitable burner, and to both for having rrived by combined labor in the production of a lamp or light of ntense white heat, which, being of small volume, and being capable f concentration at one point, is of appreciable value to the specialist nd microscopist. I will not take up your time with too much echnical explanatory details, but merely allude to the leading oints, such as the zirconite, which is prepared by fritting the zir-onearth with a slight mixture of other material, and then by use f pressure. It can be, by his system, formed into homogeneous odies of any size or shape. The zirconite is also porous, to better vithstand the sudden and quick change of temperature, and yet ufficiently hard to be easily manipulated.

The Max Wolz burner is cheap and simple, possessing all the dvantages of the Linnemann. It is so constructed that even when he pressure of the oxygen gas may somewhat vary the flame it is ut slightly affected. The changeable friction of the gases, the eculiarly-constructed outlet, producing self-regulation, renders the urner practically useful. The dimensions are so chosen that with he smallest quantity of gas a maximum of light can be attained. It vould not be economical to manufacture larger burners, for with a hicker central oxygen jet the mixture of the gases would be less erfect and unburned, and would very easily be lost on the hot glow-ody. Such a defective burning of the flame can be recognized by ooking at the illuminating point of the glow-body through a dark lass,—the spot where unburned oxygen reaches being dark or lackish.

I will now allude to another and one of the most valuable atures of this illuminator,—viz., the glass-tube projectors, or etter, the reflectors of the light, which are a revelation in their eculiarity and quite astounding as to the results of their capacity. few remarks tending to explain the principle of their action will ot be out of place. Their construction is based on the *total re-ection*, which rays of light suffer under certain conditions, at the ividing surfaces between glass and air, when their tendency is om the glass towards the atmosphere. Those rays falling obliquely ll, according to Lothe's laws of refraction, be diverted,—turned way. Now, as the diversion in the transmission from glass to mosphere—bodies of great difference of density—is quite con-derable, the oblique rays as a consequence will be reflected to the terior of the glass block again. This takes place by glass and

air when the emission-angle is about 40¾° and less. By recog nition of these physical laws of total reflection, glass bodies can b produced, in which light, when once received, can be increased by continuous total reflection, until it reaches a surface at an angle o more than 42° from the receptive point, where it then issues When light falls into or is conducted to a glass rod at a rec tangular surface parallel to its length (or even slightly oblique), i cannot leave the rod, and must, when not partly absorbed by th glass, radiate as strong from the other end. The same takes plac when the glass rod is so bent that the limits of total reflection ar not overstepped.

Glass rods can be so prepared to evade light emanating from side surfaces, so that the light can be led through perfectly pure glas with perfect side-surfaces with inconsiderable loss of power. Th glass rod can be bent to a total inverted curve. As one end of glass rod can be easily brought into the neighborhood of a stron light, and the other end close to an object, which will or canno suffer a nearer approach to the light on account of its heat, yo can perceive the advantages of this peculiarity of the lamp.

The glass rods must be specially prepared and chosen for th use of this reflection, as the ordinary ones in trade, when trans versely transparent, are, in their parallel length, full of defects, an mostly permit only red or blue light to pass through, absorbin every other.

To the mechanician, Mr. Max Wolz, of Bonn, the manufacture of this lamp, much praise is due for his trials and work in thi direction until satisfactory results were reached.

THE DENTIST'S HYGIENE.[1]

BY E. DE TREY, D.D.S., BASEL, SWITZERLAND.

GENTLEMEN,—I do not remember meeting with any treatise bea ing directly on the subject of the *dentist's own hygiene*, though the are several bearing upon dental hygiene. This is certainly a ver important question. The loss of health too often incurred by th long-continued practice of dentistry is a sad proof of the necessit

[1] Read before the American Dental Society of Europe, at Heidelberg, A gust, 1891.

this article. The dentist must keep his health for his own sake nd that of his clients. Operating from day to day produces a eavy strain on the vital forces, and induces great nervous tension the operator.

What a pity to see a man practising his art under unfavorable onditions!

The digestive and respiratory organs suffer from the abnormal osition of the body; the nervous system continually strained, like he cord of a bent bow, ceases at last to perform its functions, and nally the operator tires of his vocation, while his work loses its ormer excellence.

It is only by wisely regulating the details of his life that the ractitioner can attain clear and intelligent conceptions, rapid and asy execution, as well as find pleasure in the performance of his uties. Long is the list of men engaged in intellectual or manual ursuits who, by neglecting the laws of hygiene, have seen their trength decline, and, cut down prematurely, they have not fulfilled he hopes entertained of them, nor furnished that career which they hemselves had traced out.

This abstract is offered only to the serious members of our pro- ession, and not to those whose ignorance and incapacity lower and legrade it to the level of charlatanism. I shall attempt to perform ny task as well as I can, and as far as an experience of twenty- hree years will enable me.

To practise dentistry it is necessary to have good health and a trong constitution, plenty of muscular force, and an active, nervous emperament, because a phlegmatic man can never make a good perator. By means of hygiene, it is not only possible to keep ne's self up to the mark, but also to make up for one's deficiencies, the one case by a careful diet and healthy habits, and in the ther by a painstaking and methodical manner of operating.

The questions of situation, light, ventilation, and heating are all nportant ones to the dentist's health. Considering that he has to ass a great part of his time in-doors, a gay and sunny apartment ill have a beneficial effect on his character. The operating-room ust be so separated from the waiting-room that the cries, groans, conversation of the patient cannot be overheard. The proximity the two would distract the operator, and increase his nervous nsion, which is bad for all concerned.

The laboratory must also be at some distance from the oper- ing-room, without being out of reach. An equable temperature ust reign in the different rooms, because the operator is likely to

cool down quickly after heavy work. The temperature ought to be about 20° C. He who works in-doors requires a higher temperature than he who works out of doors; the latter takes more exercise, and the natural heat thus developed is increased by more abundant feeding. On the other hand, overheated air draws the blood to the brain, where it is always attracted by intellectual effort. The temperature must be constant, else the operator, absorbed in his work, may not notice its variations. The operating chair should not be too near the fire. Moreover, as much as possible, let the windows remain open, as fresh air is highly beneficial to health. An open chimney with a wood-fire is best in the operating-room, because this system constantly renews the air; a stove will do for the rest of the apartment. A northern light is best for the sight, on account of its steadiness; and western light is less blinding than an eastern one. The most valuable operating is done in the morning hours, when the body has been refreshed with sleep. A southern light is bad on account of its unsteadiness and the heat from the sun's rays. If the light is reverberated by a sheet of water below the window it becomes very vacillating. A blind working upward will greatly lessen this evil, which is very prejudicial to the sight.

The dentist practising in a dark street, or in a misty country such as England, will find a white blind working from below upward very useful.

In choosing an operating-room, attention must be given to the size, and especially to the height of the windows, as well as to the size of the room, which ought to be spacious. It is easy to understand that plenty of air and light conduce to better work than a restricted amount of these.

A continual subject of discussion is the point whether the dentist's residence should be at or away from the spot of his labor. The author has tried both plans. Keeping up separate apartments is expensive, but a counterbalancing benefit is the necessity of walking to and fro, and thus getting needful exercise and a change of ideas. The practitioner who simply leaves his operating-room to pass into an adjoining one for his meals, is liable to lose his appetite, get enervated and cross, and his food will not profit him as it should. If he be not forced to take out-door exercise, he will often become neglectful of it, and the less he takes, the less he will wish to take. Patients knowing that a man resides where he practises will often insist on seeing him just for a moment at undue times and in spite of orders against their admission. The combi-

n of residence and office is useful for saving time, for easier rk and study during the winter evenings. On the other hand, e dentist is thus more easily distracted by the ties of family life. l things considered, the author is of opinion that the advantages enforced exercise ought to overrule all other consideration. Great anliness must reign all over the apartment. The laboratory ould have a chimney to carry off all acid and vulcanizing smells d vapors, which rust and corrode metal substances lying around. r the same reason, the apartment must be well ventilated morn- g and evening. In short, he who takes pride and pleasure in his lling will have an inviting, comfortable, and even stylish interior, as to please clients, and even draw compliments from them.

The operator must be very careful about his personal appear- ce; he must have a special working-coat or jacket, to avoid car- ing with him tobacco and other odors. A white, easy-fitting gar- ent is desirable. In winter a warm Jæger coat is practical, though e best thing is white cloth or smooth silk, which both look and el clean and neat. Black coats easily become greasy by contact th the patient's hair, or soiled by the cosmetics which ladies some- nes use.

It is difficult to lay too much stress on these niceties, which are uch appreciated by the better class of clients, and the observance which tends to build a good practice. Footwear must be soft and arm in winter, light and fresh in summer; special pairs being pt for exclusive use in the dental office. A low shoe of good calf, nnel- or fur-lined, is best in cold weather. Prolonged standing is iguing, therefore the dentist should have his feet easy and com- table. A warm foot-bath after the day's work is over is often neficial, for it promotes the circulation and relaxes the nerves. tellectual effort draws the blood to the head, and the feet get cold consequence, a thing to be avoided, as warm feet and a cool ad insure good digestion.

Those who perspire freely from the feet should change socks e or twice a day. The writer would here remark that he has own two cases in which, perspiration having been artificially pped, a dangerous illness was the result, followed by death. stic boots are apt to stop circulation, but low shoes allow the ape of heat and moisture, and are not conducive to cold feet.

The old saying of warm feet, cool head, and loose waist is to be nembered and practised. The neck also should be free, without igh or narrow collar. The pressure of a hard collar on the veins the neck during the various flections of the head brings on con-

gestion of the brain; and this is very bad in the case of thick-necked men with apoplectic tendencies. A fine white flannel, with loose silk tie, would be best, if etiquette allowed it.

A dentist must have perfectly clean and well-kept hands, with nails not too long. Patients have complained to us of having been scratched by too long nails, and one lovely client made us once pare our nails on the spot. Yet it is necessary to keep those of the thumb and forefinger long enough to pick up quickly the various little implements in daily use. Another point is, that an operator should not in general use too-highly-scented soap; in fact, excep tional cases apart, scent of any kind is out of place. The hands should be washed in the patient's presence, and every time the den tist is called out of his room.

When hands and arms begin to feel nervous twitchings, the best thing is to plunge them up to the elbow in lukewarm water. Should there be tension, congestion, or weariness of the brain, a cold bath will act very well. The handling of steel instruments produces horny fingers, which lose their tactile sensibility. To regain this rub the fingers on pumice-stone, without taking off too much skin as a certain amount of hardness is necessary.

Above all, the dentist's own mouth must be in a fit and proper condition; a bad breath is sufficient to drive away patients. There are means of rapidly sweetening the breath, but they are unwhole some to the stomach. Here are a few useful ones: Chew a slice of lemon with the rind on; this will freshen the breath for a fairly long time. The smell of garlic disappears by chewing parsley and swal lowing its juice. A few drops of "hypochloride of soda" (liqueur de Labarraque) in half a tumbler of water constitute an effective and powerful deodorizer. The too frequent use of aromatic extracts such as catechu, cloves, peppermint, etc., may injure the stomach. Catechu, for example, is an astringent which contracts the walls of the stomach, often producing cramps the origin of which is un suspected. Cloves cauterize the mucous membrane, and deprive it of its smoothness. Generally speaking, all these substances injure the sense of taste. Chewed coffee-beans adhere to the lining of the stomach in noxious deposits. Coffee is an excellent antidote against alkaloids; a spoonful will mask their smell and annul their effects, used internally or as a gargle. Coffee and milk for break fast is nutritious, laxative and disinfectant.

The posture of the body whilst operating, as will be shown fur ther on, has considerable influence on the health. It is rare to find a dentist who knows how to place his patient in the chair so as t

facilitate his own work and avoid mutual torture. While possessing all necessary means for working with comfort to themselves, why will not dentists take the trouble to put their patients in a position easy for both parties, instead of going through a sort of gymnastics hurtful to the eyes, lungs, and stomach? The right eye of a dentist who does much gold-filling, after fixing the same brilliant spot for hours, gets tired and becomes weak long before the left one. Deviation of the visual rays is an affection which almost always affects the right eye, and is caused by the ocular globe being twisted away from its normal position, when some muscles are overstrained and others relaxed; this habit in time dims and weakens the vision. The best and simplest way to avoid this trouble is to so place the patient in the chair as to bring all available light on the point of operation, and to look at it in a straight line, and not from a slanting direction. Also, one must learn to operate on both sides of the patient, and from behind as well as in front. By means of these different positions the visual rays enter squarely into the eye in its normal and unstrained position, and not sideways, and both eyes work equally. These methods of operating are soon learned, and their advantage quickly perceived. Operators will do well to think of the means of preserving their eyesight while still young, before becoming slaves to spectacles. Their usage is a source of annoyance to the practitioner, because the patient's breath clouds them, causing loss of time in removing and wiping. A good magnifying-glass should always be at hand, to avoid straining the sight looking at small objects, such as burr-heads, for instance. Blue glasses are good for softening glare and change of light. The means of bettering the sight when it begins to fail are numerous, but the simplest and best are rest and refreshing sleep, such as hygiene and exercise produce; reading at night, indulgence in alcohol and tobacco must be given up. Electric, petroleum, and all lamps with too powerful a glare are to be avoided; the old moderator lamps are the best. Few organs of the body are so sensitive to the diseases of the stomach as the eyes. Dimmed and vacillating vision, pain behind the eyeballs, watering eyes are almost always symptoms of a disordered stomach. Rose- or chamomile-water makes an excellent eyewash; an infusion of rosemary in good cognac brandy is good for frictions around the orbit, the brow, temples, and neck. As a rule, let us not turn night into day, but, returning to the ways of our forefathers, go to bed and rise early. They knew not the use of spectacles before old age, nor did they need the various exciting modern condiments.

In the course of numerous excursions in the Alps, the author has made some curious observations on the changes going on in the country at large. With the advent of coffee, sugar, spices, and alcohol in the most secluded valleys, the hitherto vigorous and healthy inhabitants have begun to lose their fine teeth and flowing hair. All sorts of infirmities, unknown before, have appeared among these hardy mountaineers. The author is quite convinced that this is due to alterations of the blood, brought about by exciting foods. Let us leave hot things to hot lands, and cling to what nature grows in our temperate zones. The first effect of these stimulants seems to be renewed life, vigor, and keenness, but their continued use brings in time prostration and even loss of health. Such is also the case with plants transferred from their own natural soil into a richer one: they thrive, increase in size and beauty, then droop and die away. Nervous diseases and folly count more victims nowadays than formerly in town or country, thanks to bodily and mental excitement and fast living. Let us work quietly day by day, not peering too far ahead into the future. Thus, money will be more slowly acquired, but the faculty of enjoying it in old age will be preserved. On hygiene depends the surety and suppleness of the hand, the clear vision of the eye, and on these does the dentist himself rely. Delicacy of touch is a gift, which can be developed, but not acquired; few possess it, and those who do should not imperil it by excess of any kind. It can be cultivated from infancy and maintained through life by manual exercises. This attribute can be unconsciously lost by excesses. The abuse of wines, spirits, and tobacco leads to that of narcotics, which doctors and dentists have within their reach. We cannot enough warn operators against being tempted to their use to soothe wearied nerves, for no human words can tell the sufferings to be encountered before the habit is broken. Unfortunately, numbers of medical and dental men use these drugs themselves, though they forbid them to their patients. Here are the words of a specialist in nervous and mental diseases, Dr. Foree, of Zurich: "How great a number of men are lost to science by the use of alcohol! Even what is called a moderate amount is sufficient in time to alter the tissues and weaken the mental faculties." Total abstinence is more profitable than simple temperance. If the thoughts and actions are not so quick, they are all the more reliable; fatigue and ailments have less hold on the total abstainer.

The strength and suppleness of the hand depend on that of the body. All exercises of sport and gymnastics, abundant in youth

more moderate in manhood, are a boon to the body. Combine these with hydrotherapeutics, and you have the secret of good health and good humor, wherewith to perform daily work easily and pleasantly.

Half an hour should be given every morning to bedroom gymnastics on the Swedish system, adding cold or tepid baths according to individual natures, or simply sponging the upper part of the body. These exercises must be done slowly, and in a measured way, not with rapid and unsystematic movements. To undergo a hydrotherapeutic cure in a first-class establishment is for a run-down and overworked dentist the best means of recovering health and condition. Unfortunately, these good establishments are by no means common, and we only know one, that of "Schœnbrunn," in the Canton of Zug, where the basis of the treatment consists in the avoidance of all stimulants, as alcohol, tea, coffee, pepper, spices, etc.

The dentist must not only exercise his arms and legs, but his wrists and fingers separately. It may happen that he who has not been in the habit of practising gymnastics from infancy may feel tired at first; the best plan is, then, to exercise for four or five minutes in the beginning, gradually increasing the length of the periods up to one-quarter of an hour. Frictions with rosemary and spirits strengthen and keep up the suppleness of the arms; not to mention that this old remedy is good for rheumatism. Finally, the best way to counteract the effects of a too-sedentary life is to take all possible exercise between working-hours.

What one should eat is a subject of some importance, and it is to be supposed that every one knows best what suits him, yet such is not the case. A fair meal after morning exercise is necessary to do four hours' work, and a light mid-day lunch is better than a full dinner, which makes one feel heavy and lazy. Owing to bodily fatigue and nervous tension, the dentist is at times liable to a sensation of weakness and loss of energy; this is due to a momentary lack of nourishing substances. Here Hygiene steps in and says, stop and replenish the motor; or, in other words, take some light food,—whereupon the sinking sensation will disappear. A drop of soup about ten o'clock, a cup of tea and a biscuit about four, is all that is needed to revive the flagging energy of body and mind. The general appetite for regular meals will in no ways be injured by this habit, which is a national custom in several countries, chiefly in the North. This plan helps to avoid excess at any one time. For those men who are obliged to subject their bodies to postures which prevent the free play of the internal organs, frequent and

spare meals will help to facilitate easy digestion. Plenty of milk is an excellent means of calming nervous irritation.

Sleep is the chief factor in general and dental well-being. Loss of sleep means loss of strength ; no sleep, no work. By a hygienic mode of life the act of sleeping becomes a source of pleasure, a delicious close to the day's work.

To obtain deep, calm sleep, without dreams or nightmare, total abstinence, or, at least, a very limited use of alcoholic stimulants, must be the rule. Less noxious but still powerful stimulants, such as tea and coffee, must be avoided as the night-hours draw on.

But contentment of mind comes not only from a hygienic life, but from a feeling of confidence in the future, and where this source of trustfulness is to be found, you all know. If I here enter the domain of moral and intellectual hygiene, it is because I have convinced myself of its power on the nervous functions. The sentiment of religious duties performed sincerely is an elixir without a rival, and an efficient soporific. There is the secret of a contented and happy life. As meals should take place with regularity, so should sleeping-hours be regular.

We would utter a warning-cry as to the necessity of timely relaxation from continuous toil,—to all those who are carried away by duty, love of work or money, and who labor on for years without taking the necessary holiday. As soon as the dentist takes stimulants to keep up his flagging strength, he is overstepping the limit and working too hard. Each practitioner has, according to his strength, a limited number of years before him. Therefore, let every one starting in the profession understand before it is too late that he must make his position more or less rapidly; for few vocations entail so much fatigue, wear, and tear as genuine and artistic dentistry.



NITRITE OF AMYL.[1]

BY HENRY A. KELLEY, D.M.D.

This drug has received considerable attention from the medical profession during the past few years, and is of interest to dentists, as it is one of the best antagonists to cocaine, and is so recommended by many of our authorities. It is also used very successfully in

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[1] Read before the Harvard Odontological Society, December 23, 1891.

cases of collapse from anæsthetics, and in hysteria. I might enumerate a great many uses for the drug, but suffice to say, it is a powerful antispasmodic, and whenever indicated, nitrite of amyl will be found useful.

The formula of amyl nitris is,—

$$C_5H_{11}NO_2$$

Sp. gr. . . .	0.877
Boiling point . .	182° F.

It is obtained by heating one part of strong HNO_3 with two parts of rectified fusel oil, until reaction commences, when the heat is withdrawn and afterwards reapplied. The distilled portion, obtained below 212° F. is rectified by means of carbonate of potassium, and that portion only distilled between 202° and 206° F. is reserved, being a nitrite of the oxide of amyl.

Nitrite of amyl is a yellow liquid, very volatile, and with an odor which some liken to over-ripe pears, but which I always remember by its similarity to that of the squash-bug. If you have ever been near that animal, you know the odor; and I feel sure, when once you have become familiar with it, you will never mistake it.

The best test for it is its most striking property, that of flushing the face when inhaled. There is also a sense of fulness, of giddiness, and sometimes syncope, which latter is due to the sudden rush of blood to the periphery, thus drawing it from the brain. This flushing of the face was first noticed by Dr. Guthrie, in 1859. It was not until 1866 that attention was again called to the drug by Dr. Richardson. Dr. Richardson presented the following conclusions:

"1. It is absorbed by the skin, stomach, lungs, and cellular tissue.

"2. After absorption its effects are seen immediately on the heart and circulation, producing, first, violent action of the heart and dilatation of the capillaries; followed, secondly, by diminished power of the heart and contraction of the extreme vessels.

"3. In man it can reduce the forces of respiration and circulation to the extent of a trance or catalepsy.

"4. It is not an anæsthetic; by it consciousness is never destroyed, unless a condition approaching death be produced.

"5. The effects of the nitrite are through the motor force, which it wildly excites and then subdues.

"6. The *modus operandi* of the drug appears to be by arresting the process of oxidation of the tissue.

"7. Physically the nitrite is between the volatile and solid bodies. Hence its effects are less effervescent than those of very volatile substances, as ether, chloroform, etc., and less certainly destructive than the solid substances, as opium, etc. In this lies the secret of its prolonged action."

It also paralyzes the nerves from periphery to centre, lessening the contractile power of the arteries.

Dr. Wood disputes the fact of its producing a great excitation of the motor system; he having found from his experiments that it produces a gradually-increasing paralysis. In regard to Dr. Richardson's other experiments, we will leave them until we come to those of other men, some of whom will confirm and others dispute them.

In regard to the trance, which we will find disputed, it is but fair to say Dr. Richardson observed animals lie in this state for many hours. You will also please remember what he says about its not being an anæsthetic, and its acting by arrest of oxidation of the tissues.

Dr. Brunton has, perhaps, investigated this subject as thoroughly as any experimenter up to the present time. They were performed in the laboratory of and observed by Professor Luding, of Leipsic, and must carry great weight. They are mostly upon rabbits. The animals were not allowed to breathe the vapor directly, but were supplied, artificially, by an apparatus so arranged that air might be sent directly through the bellows and tube into the lungs, or passed through a vessel containing the vapor of nitrite of amyl.

The bellows being worked by an engine with great regularity, an even respiration was produced, and the disturbing influences on the blood were in a great measure avoided.

Uneven respiration causes suspension of this function for a short time when any strong-smelling vapor, such as we know nitrite of amyl to be, is administered. Also by the alteration in the condition of the blood, caused by this uneven respiration, irritation of the vagus, and thus slowing of the heart is produced.

The vagus being the inhibitory nerve of the heart, any irritation or stimulation must cause slowing of the heart-beat.

On the inhalation of air charged with the nitrite the blood-pressure rapidly sank, the pulse-rate being unaffected.

On the continuance of the administration the pressure rose

After twenty seconds the vapor was discontinued, and the pressure rose even more strongly, and at the longest attained its normal height in one minute.

This experiment demonstrated that small quantities produce great effects, soon passing off; becoming either excreted or destroyed in the body.

To counteract the effects of convulsions experienced by the animal, and which it was thought affected the results, the next one was treated with curare; a poison whose action is to paralyze the voluntary but not the involuntary muscles.

Under these conditions the pressure sank at once, as in the previous experiment; but, unlike it, did not return to the normal as long as the animal was given the drug. These convulsions have very seldom been noticed in man under the influence of amyl. Now, this lowering of the blood-pressure, is it caused by the lessened power of the heart, or by the dilatation of the arteries? It is due to the dilatation of the arteries, for the same flushing may be produced by the section of the sympathetic. This section paralyzes the vaso-constrictors, which give the "tone," and thus allows dilatation of the arteries. This is well illustrated, experimentally, by section of the sympathetic in a rabbit, and noting the flushing of the ear. This tone of the arteries I have spoken of is probably due to a certain constriction of the muscular, or middle, coat, but this is regulated and augmented by the so-called vaso-motors; and here, if you will permit me, I would like to refresh your memory in regard to the vaso-motor nerves. There is one class of these nerves called vaso-dilators, the irritation of which always causes dilatation, as the chorda tympani; another class called vaso-constrictors, for they always constrict the arteries when irritated, as the cervical sympathetic; and a third class, sometimes causing dilatation, and at other times constriction, as the sciatic. Perhaps we should not call this last a class by itself, for it is due simply to the fact that some nerves, such as the sciatic, carry fibres of both vaso-dilators and vaso-constrictors.

Now, it must be plain, if, as in the experiment, we cut the sympathetic, which has vaso-constrictor fibres in it, we paralyze the vaso-constrictors which give the tone to the arteries of the rabbit's ear, for this is the nerve that is distributed to those arteries. When this constriction is removed these must dilate, and we see the flushing, which, as I said, must be due to their dilatation. Having decided this point, the discussion must proceed to another not so easily disposed of.

Is this dilatation caused by the direct action of the amyl on the walls of the arteries, or through the vaso-motor centre in the medulla oblongata?

The almost universal belief was, at first, in favor of the action through the vaso-motors, and this view was taken by Drs. Richardson and Waldo. This theory has to-day many supporters. Brunton admits they may play a small part, but does not believe in them as the principal cause.

Dr. Waldo's reasons for supporting the vaso-motor theory were that the flushing which follows the use of amyl is nearly absent in paralytics, in whom the whole motor system is paralyzed; while in epileptics, in whom the vaso-motor nerves are very sensitive, the flush is very decided.

But, from my study, I am led to the opinion that it is through the walls of the arteries the nitrite acts. Let us look at Brunton's experiment on this point.

Now, provided the nitrite acts through the vaso-motor centres in the brain, the nitrite could not possibly have any effect if these centres be separated from the vessels by cutting the cord at the neck. But if, on the other hand, it acts directly on the vessels, this cutting should not affect the result of the administration of the vapor. So, from this reasoning, Brunton cut the cord, and immediately the blood-tension sank very low, owing to the loss of tone of the arteries, they being cut off from their vaso-motors. He then gave the amyl, and observed a still further sinking of the tension. And this lowering of the tension bore the same relation to the existing tension before giving the vapor that it did in experiments performed without cutting the vaso-motors.

This seems to me a very conclusive experiment in favor of its action on the walls of the arteries. The only objection I can see to the experiment is the fact that he does not cut off all his vaso-motor centres—for there are such centres—down the spinal cord. But these are not usually active, and so may practically be excluded.

I will now call your attention to a few experiments made by Dr. H. C. Wood. These experiments I take from his essay, successfully competing for a prize offered by the Massachusetts General Hospital for original work.

A kitten was given twenty to thirty drops by inhalation. It died in a few moments without struggling. At immediate autopsy the heart was found beating strong, and continued to beat vigorously for ten minutes. Blood was found of a dark color; no dis

nction between venous and arterial blood being made out. In all is experiments this dark blood was present when the experiment as carried to death. Here is a severe blow to that favorite theory f some to account for anæsthesia,—namely, by withholding oxygen rom the blood. Here is a drug which withholds the oxygen to uch an extent that the venous and arterial blood cannot be distin-uished, and yet is not an anæsthetic.

Dr. Wood did not observe the trance-like condition observed by Dr. Richardson, and he claims consciousness is always lost very ate, and not early.

In all his experiments there was a great loss of muscular power. Now, this may have happened in four ways:

1. Impairment of the will-power to arouse the motor-ganglia of he spine.
2. Impairment of the power of said ganglia.
3. Impairment of the conducting power of the nerves.
4. Impairment of the contractile power of the muscles.

In answer to the first and second, I may say there is no proof of he drug possessing such peculiar powers. So we will dismiss them at nce as to the action on the conducting power of the nerves and the ontractility of the muscles. Wood demonstrated in fatal doses hat it affects but does not destroy the conductility of the nerves. He then showed that the local application of the amyl destroyed he contractile power of the muscles. Therefore, the nitrite acted o paralyze the muscles, and this accounts for the great loss of ower manifested.

This has an important bearing on the question, whether the aso-motor nerves do or do not cause the dilatation of the arteries.

Dr. Wood agrees with Brunton that the nitrite of amyl dimin-shes the blood-pressure; that the division of the vagus does not ffect this result, and that it still acts after the division of the spinal ord at the neck.

Now, of the four ways in which the circulation of the blood can e affected by this drug:

(I recognize, of course, that there are many more ways in which he circulation of the blood is influenced, but I do not think they re sufficient to produce the great lowering of tension we see pro-uced by the action of the amyl.)

1. It may be influenced by the vagus.
2. By the accelerator nerves.

Both of these, I have shown, are not the cause.

3. By acting on the muscles of the heart. That this is not the

true cause in this case may be shown by compressing the aorta in the abdomen, after dividing the spinal cord in the neck. Thus the flow of blood to the lower extremities is checked, but on inhalation a rising, though more generally a sinking, pressure (which is much less than in the normal) occurs.

If the nitrite acted on the heart, the compressing of the arteries would not affect the result. Therefore, it must act on the capillaries.

4. This it does, in my belief, by paralyzing the muscular coat of the arteries, as I called your attention to its being able to paralyze muscle when applied locally.

If it can cause this complete paralysis in fatal doses, it is fair, I think, to suppose it can cause a partial paralysis in moderate doses and thus produce a dilatation; hence the low tension observed of the blood-circulation.

It is usually administered by inhalation, and is comparatively harmless.

Weak and nervous people are very susceptible to its influence and care should be taken when using it with them. A small dose should first be given as an indicator. Like many other drugs a patient may become accustomed to its presence, and be able to tolerate large doses after inhaling it regularly. Persons using it for angina pectoris find, in order to get the relief they look for, that they are obliged to increase the dose, and, finally, there are some cases where it has ceased to benefit.

This use of nitrite of amyl in angina pectoris is an illustration of a theory which worked well in practice. Brunton knew that distinctive property of this drug was to lower the blood-tension and also that the disease, angina pectoris, was always accompanied by a high blood-tension. Therefore he prescribed nitrite of amyl with what results can be told you by the many victims of the disease who break their capsule of amyl nitrite on their handkerchief when warned of its appearance, and thus prevent the threatened attack.

It is usually administered by inhalation, and as it deteriorates on exposure to the air, it is best kept in little glass capsules or pearls, three or five drops. These are broken on the handkerchief and then applied to the nostril.

The dose usually given by inhalation is from two to three drops. Not more than three should be given, unless the patient is accustomed to its use. I consider five as large a dose as it is advisable to give, and usually find two sufficient. It is administered by the

mach in doses from one-quarter to one minim; but the results much more satisfactory when inhaled.

The antagonists to this drug are ergot, belladonna, and other nal stimulants.

IE PHYSIOGNOMICAL SIGNIFICANCE OF THE TEETH.

BY GEORGE W. WARREN, D.D.S., PHILADELPHIA.

THE physiognomical function of the face is to depict to the world e true character of the "inner man;" it is the mirror of the emo-ns; yes, of the heart itself. The faculty of reading the character the outward natural signs is instinctive in all men, though some ve become so skilled by exercising and developing it that they im to have occult powers, and, with tact and a fertile imagina-n, do not fail to draw about them many faithful followers. Lav-or says, "I am persuaded that faces are as legible as books, and e read in much less time, and are less likely to deceive us; in fact, cannot recollect that my skill in physiognomy ever deceived me." is man was one of the early students of physiognomy, and about 00 wrote numerous volumes on the subject. His works are, as he rmed them, "fragments;" they are without system; and while they ntain a great deal that is good and true, they contain much that impractical. He has so loaded down the truth with a burden of ntasy that he did not succeed in removing the study from where had been for centuries,—associated with the so-called occult arts.

The one person who has lifted it from these associations and ced it upon a scientific basis is Mrs. Mary Olmstead Stanton, ose latest work, "A System of Practical and Scientific Physi-nomy," is found upon the shelves of our best libraries. It com-ses two bulky volumes of as solid and entertaining a piece of rature as often comes from the pen of woman.

In making up the facial features, the jaws and teeth play a very portant part. The teeth, standing as they do as guards about entrance to the digestive tract, tell to the thoughtful student—their size, form, color, texture, and relative position—not only the physiological condition of the individual, but of the mental moral power or weakness which have been created largely by siological activities. Many suppose that dental prosthesis re-res no knowledge other than abstract mechanics or merely nual skill. It is just here, however, in the preparation of ar-

tificial dentures that the highest workmanship is called for. Eacl case involves the necessity of the possession of sufficient knowl edge not only of the physiological, but of the physiognomical, condi tion of the mouth, and skill to restore what is lost. We must firs learn to appreciate nature's own work before we can expect to ever approximate such perfection. From the similarity of the majority of artificial teeth, there is room in the profession at large for greater study and more artistic work in this branch of our profes sion. The closest study is needed here to correct the meaningless "horseshoe-style," so prevalent throughout the country. And how often we see even, white teeth where every feature cries ou against them. We could hardly find two people with exactly th same facial angle and conformation. The patient's individuality should be well studied before an attempt is made to prepare a artificial denture. The temperament, contour of the face an body, the complexion, age, etc., should be considered, and th artificial denture be constructed in accordance with these physiog nomical and other requirements.

Artificial teeth, as manufactured at the depots for the profes sion, are mere blanks that have to be—or, rather, should be—s shaped and prepared as to harmonize with the facial requirement of each individual patient. Take, for example, a patient of th sanguine temperament. We know that nature gives this tem perament teeth that are well proportioned,—abounding in curve arranged in a full, round arch,—with an articulation that is mo erately firm and corresponding generally to the contour of the fac and head.

"To individualize the teeth, the cutting-edges of the incisor must be ground to imitate wear by mastication, more or les according to the age of the patient; the natural occlusion bein nearly on end, the front teeth are much worn away. To imita this waste of tooth-substance gives the operator a fair chance t show his skill and judgment. The cutting-edges of artificial teet as received from the depot, are always rounded. This edge shou be so ground as to give it a worn appearance. The smallest cut o the edge of each incisor and cuspid will vary the expression greatl and give character to the teeth according to the slope given a the amount removed, rendering it difficult to recognize them as th same set of teeth."

It is sometimes advantageous to leave out a tooth on one sid say a first bicuspid, and bring the second bicuspid forward abo half the width of the tooth removed, representing the loss of

oth with the space partially closed up. Or a pleasing effect can metimes be obtained by leaving out the second bicuspid tooth and serting a gold crown in its place, and very natural effects be ade by securing the teeth before they are baked at the depot, and rve and stain them according to the case in hand.

Again, it is in some cases necessary to imitate the irregularities the natural teeth in order to restore the features; and as Dr. . R. Hall has said, "This is a very difficult feat to perform, and is ldom successful, as, when attempted, it is usually overdone, and ithout judgment. Crowding and overlapping gives a confused nd bewildering look to the mouth, entirely contrary to the indicaons of the majority of patients. Irregularities are more numerus in adults of the bilious temperament than any other, and more rongly marked, being in perfect accordance with the rugged haracteristics of this type, which is noted for its force, tumultuous assions, and energy of action; but even in this temperament the eeth must be placed and grouped together in such a way as to onvey the idea of strength and energy, not a confused jumble."

As another has well said, "If we have not ideal teeth, the probbilities are that there are many other things in feature and complexion which also are far from our highest conception; and the ntroduction of one or more ideal teeth, where the surroundings re anything but artistic, is no improvement. It creates a discordnt note, and destroys the harmony which prevails even in ugliness, nd renders that ugliness more evident and more unpleasant. But requires a high conception of true art to thoroughly appreciate hese principles and apply them in practice. It is, therefore, not urprising to find that distinguished dentists are the constant and ppreciated friends of men of art and of letters."

Reports of Society Meetings.

NEW YORK ODONTOLOGICAL SOCIETY.

A REGULAR meeting of the New York Odontological Society was eld on Tuesday evening, March 15, 1892, at the New York cademy of Medicine, No. 17 West Forty-third Street, with the resident, Dr. Woodward in the chair.

The minutes of the previous meeting were read and approved.

INCIDENTS OF OFFICE PRACTICE.

Dr. Bogue.—I do not know what is new and what is old, but I will take the liberty to present a paint-box, furnished by Poulson, of Hamburg, containing eight colors, most of them oxides, and three bottles of oil, a box of platinum, brushes, etc. The object is to paint artificial teeth any color you need, and then bake it in. I had occasion to do something for a lady, who said, "Do not try to make me beautiful or the teeth beautiful." This is a specimen of what was done in the case, and I will pass it around. The colors I have not seen here. The upper part of this tooth has been painted and baked in afterwards. I imitated in a number of teeth the cavities and other defects that existed in the loose teeth that I had to extract.

Dr. Howe said he had not seen stearine used on oxyphosphate fillings. Here it is, and if any one wishes to help himself to a piece, he is welcome to it. It is to be flushed over the surface of the filling; it will polish somewhat more like enamel than the opaque phosphate filling.

The other day I needed a burnisher for a gold filling. I happened to find a glass bead of the proper shape; I placed it on an old engine burr, and had a beautiful instrument. I cemented with shellac, being sure the bead was hot enough to melt it.

Dr. John S. Marshall, of Chicago, Illinois, then read a paper, entitled, "Shock and Collapse resulting from Dental Operations."

(For Dr. Marshall's paper, see page 405.)

DISCUSSION.

Dr. Francis.—I have been waiting very patiently to hear some one speak upon this paper, which I consider a most excellent one, and contains many practical suggestions that come right home to us. I do not believe, and never have believed, in lengthy dental operations, and experience has taught me that very few people can sit more than an hour and a half or two hours in the dentist's chair without feeling much fatigue afterwards. They may not perceive it so much at the time as they are apt to do after they get home. I am in the habit of asking patients if they feel tired when operations are lengthy. Sometimes they say not, especially when they are anxious to have their work completed. When I consider that they have sat long enough, I send them home, and they often thank me for it afterwards.

I think we cannot be too careful in avoiding lengthy and pain

ul operations for children. I rarely introduce gold fillings, and ever very large ones, into the teeth of young children. I refer o the permanent teeth, of course; yet I have seen many tem- orary teeth filled with gold. Sixth-year molars are sometimes filled vith gold soon after eruption, but in such cases they are liable o give out in a short time. They would do much better if filled vith some plastic stopping. A lady in my office, one day, for vhose child I was then operating, said to me that the child's ldest sister had previously quite a number of teeth filled by an xcellent dentist. He did some very heroic work for her, and was nxious to have all the work done in a very limited time. After he operations were over, the child had St. Vitus's dance, and was or a long time in a very nervous condition.

Dr. Jarvie.—The paper is of such a character that one cannot ut heartily recommend it. I am glad to see that he speaks not nly of nervous strain upon the patient, but also of the nervous train that the dentist is constantly subjected to. The experience hat the essayist has had has been shared by most of us. I think nat many dentists are often regardless of the tension upon the atient; the results are often exceedingly severe upon the middle- ged as well as the young.

In all operations upon children's teeth, the facility with which ertain materials can be employed, even with only temporary ben- fit, ought to be considered; and often it is desirable to so treat ne teeth as to tide them over a few months, and then repeat the peration, rather than subject a timid child to a long-continued ervous strain. A gentleman, of at least fifty years of age,—a man f iron nerve as well as muscle, a man who had an utter contempt r any kind of nervousness,—came to me one day. He had been a atient of mine for years, and would sit in the chair for hours, and ubmit to what would ordinarily be painful operations, with appar- nt indifference. His incisor teeth had worn away, and it seemed dvisable to protect them, and also to lengthen the bite. Of course involved sittings of some length, and he was quite desirous to end every morning with me until the work would be completed. told him he ought not to do it, that the strain would be too eat. I remember his look of contempt when he said he could and anything. I told him I thought I knew better, and said to m I would give him two mornings in succession, so as to get a od bearing, and then wait eight or ten days. He thought it was liculous, but I was immovable. The first sitting I capped two eth, and then at the next I did two more. The operations were

long, but they were not painful, yet he seemed to feel them more than he had in former times. He crawled out of my office without any sort of life or spirit, and he did not want to come near me for two weeks. That was a strong, well man. With children, and young ladies especially, the dentist should see that they do not have longer sittings than are necessary, and then have a sufficient time in which to recover from the strain before the next sitting.

Now, in regard to the dentist. I am a very earnest advocate of the desirability that the dentist should take a vacation from time to time, so as to keep himself in good condition. He ought not to allow himself to run down, constantly feeling fatigued and tired,—commencing in the morning with a feeling of almost terror at the day's work before him, and with a sense of intense relief when the day and its labors are over. A man in such a condition cannot do his best, and he is not doing justice either to himself or to his patients. Some, I know, think they are so busy that it is impossible for them to get away. They reason that if they were situated as some other people are they could do it. No one is too busy to get away. The busier a dentist is, the greater the necessity he will find for rest and fresh air occasionally, and that the world will get along without him for a time, possibly very much to his astonishment.

It may not be out of place to state my own practice, for few dentists work harder or enjoy better health. For years I have not been in my office on Saturday afternoons. Sometimes it is a long walk in the country; sometimes a drive; or it may be a saunter in New York City, looking at the shop-windows. In this way I not only get a relief from operating, but also the fresh air, and the change of thought and scene. At this season of the year, particularly, a dentist needs a vacation. He has been in his operating-room from the middle of September without any break in his regular work. With me there is a longing for fresh air that is irresistible, and, while it is as busy a season as any, yet next week I shall go away to be gone ten days, spending eight of them on the ocean, so that I can be in the air all the time. I get by this a degree of nervous force and energy that will allow me to more than make up for the lost time within six or eight weeks. I work with greater vim, and can do better work, on my return, than if I had stayed at home all the time. That is another way of recuperating. I think if we took longer vacations in the summer we could fill just as many teeth in the year, and have just as large an income. Get away from

our ordinary surroundings. It has been my custom to take an cean trip in the summer whenever practicable. I derive more bene- t from a trip of that kind than from any other. It is a practice hat is growing on professional men in this vicinity. You would be urprised to see the make-up of a passenger-list on one of the large teamers in the early part of July. I have met the same profes- ional men—lawyers and physicians—year after year, the busiest nen you can think of. They all tell the same story,—that they erive a benefit that they cannot get in any other way. We do ot need rest exactly, but we want change,—change of air, change f thought, change of scene.

Dr. Stockton.—The one point of the essayist in regard to the lling of children's teeth should be emphasized. For years I have ot filled the permanent teeth with gold, and it is the one thing hat we should impress upon our patients, especially the parents. hey say, "Are not these the permanent teeth?" Yes, but gold is ot the thing to fill them with. All of the teeth of my patients ho have been treated in this manner are better preserved. We ll know how much more exhausting it is to fill teeth for children han for adults.

I was also glad to hear the essayist speak of the proper recrea- on that we dentists should take. Do we really get the enjoy ient out of life that we should? We are doing harder work ian almost any other class of men, and we get less from it. Let s say life is worth the living. We can do it if we will. No iatter how much we accumulate here, we must leave it behind us.

Dr. Howe.—I think almost every dentist who has had some ears of experience must have come to the conclusion that most what Dr. Marshall has said is correct. But I suppose we are l apt to preach what we do not practise,—all apt to conclude iat things are right that we do not quite follow. I must admit iat I am frequently guilty of overtaxing the strength and nervous sistance of my patients, and I think it is a point that we should l bear in mind constantly. There is a tendency in practice for us desire to get through with certain work, or to be over-persuaded desire, on the part of the patient, to get through, and allow our- lves to be led to do those things which our deliberate judgment es not always approve. Let us keep in mind that we are not stified in injuring—even temporarily—our patients' health and rength in the effort to save their teeth.

Dr. S. C. G. Watkins.—I will only speak upon one point Dr. arshall made,—that in regard to the dentist's rest after the noon

meal. None of the other speakers have touched upon this, and I believe it to be a very important factor in the life of a busy operator. It is emphatically necessary for us to reserve our strength and have regular time for certain work, and just as *regular time* for the much-required rest, in order that we may give our best efforts to our patients.

As a rule, when a dentist has been in practice for fifteen o twenty years, his nervous system becomes shattered from the constant strain which he is under from overwork. This state of things we must avoid. After working steadily for four or five hours, rest must be indulged in. A nap of half an hour is sufficient for a good reinforcement of nerve-power. This is my daily habit, and I consider it a grand investment. If we have regular working hours and certain periods when we are absent from the office, our patients will soon understand that the engagements must be kept and will abide by them. I reserve every Tuesday afternoon for my own pleasure. I stop work at twelve o'clock and am through for the day. My regular patients do not come to my office on Tuesday any more than they would on Sunday. I think I work as hard as any man, but I could not do it without this rest. We can make our appointments so that we can spare time for a few days' outing. It is true, it is easier to preach than to practise, and we find difficulties in the way of taking these, but still, if we really want to we can, and we do our patients and ourselves a great injustice if we do not.

Dr. S. E. Davenport.—One of my neighbors has just whispered in my ear that this seems to him more like a Presbyterian prayer meeting than a dental meeting. We cannot get up any fight, for there is no opposite side. I think Dr. Marshall is to be congratulated upon the arrangement of the expert testimony that he has given us to-night.

Reference was made, in the paper, to the greater liability to shock and collapse coming to a patient who was only partially anæsthetized than to one entirely under the influence of an anæsthetic. In the line of that thought, which I believe is a fact not disputed, comes to my mind the discussion at our last meeting upon the use of chloroform in dental practice. We were informed that if a patient should be given a few breaths of chloroform from a small vial, the effect, though slight, would suffice to prevent the great pain usually accompanying certain dental operation. There is, of course, no doubt but that chloroform will do, in almost every case, exactly what was said of it; but I was sorry that the lack of

ime prevented a proper expression of opinion on that important ubject, for it seemed unfortunate that it should be allowed to go pon our proceedings almost without objection.

The gentleman who presented it did so in a questioning way, to e sure; and asked whether there were certain dangers connected vith such use of the drug; but the fact that he was able to give as n authority for its use the names of two or three members of this ociety has given it a prominent and important position upon our roceedings, and unless we take pains to express ourselves to the ontrary we really stand in the position of encouraging and recom- nending its use. The practice ought, in my opinion, to be strongly ondemned; the drug is too powerful, and its effects too uncertain, or safe use in our operations, and we want nothing but remedies vhich are perfectly reliable.

Dr. Bogue.—We have all had this idea of shock floating before s in a misty way, but have never expressed it. Further than vhat the other gentlemen have stated I can say nothing. If I night turn to the question just broached,—that of partial anæs- hesia,—I should like to inquire whether the evil effects of partial næsthesia have been noticed, when it has been produced by chlo- oform administered so as not to strangle or suffocate the patient. One of my children said, the other day, that in passing by a house n my neighborhood, she had smelled chloroform in the street, and ooking up to the window, had seen a surgical operation going on. t did not seem that that was the proper way to give any anæs- hetic. The best way, I think, is as follows: I have stood as ear as I am to my neighbor, and I could not detect the chloro- orm, the fact being that a little cylinder, about two and a half nches long, was attached to the mouth-piece, and on a sponge, not igger than my thumb, was poured the chloroform, a few drops at time. Whether the danger arises from the anæsthetic being given n that way, or given so that it almost suffocates the person, per- aps Dr. Marshall can tell us. I saw chloroform administered for artial anæsthesia from a little cylinder with very happy effects. have not used it myself, and should hesitate to do so; but I nagine that that nice point of danger in the case is not yet very idely understood. Will Dr. Marshall tell us?

Dr. Marshall.—I think if Dr. Bogue would visit the hospitals, nd ask to see the instrument-cases, he will find any quantity of halers that are never used now for administering chloroform. he vapor of chloroform is heavier than that of ether. It has a ndency to fall, and where you use an appliance which covers the

face, the chances are that you will smother the patient, and almost all the surgeons that I have seen operating administer it on a napkin or on a handkerchief, so as to get all the atmospheric air possible into the lungs with the chloroform. The danger is in the amount which the patient gets at first. A large percentage of all the deaths have occurred within a minute or two after the commencement of the administration, showing that the patient has been overwhelmed, or that there was organic disease of the heart. The only safe way to administer chloroform is on a thin napkin or handkerchief.

Dr. Bogue.—The remark was made that a lady took a little chloroform from a bottle held in her hand, and death supervened. I do not know whether that is correct or not.

Dr. Marshall.—Quite likely; you will find that some people are affected more by chloroform than others, the result of idiosyncrasy. My wife was in the hands of my preceptor for the treatment of an exposed pulp. He used a bit of cotton saturated in chloroform to relieve the pain. Syncope immediately followed, and he worked over her for two hours before she was fit to go home. I would no more dare to give my wife chloroform than a dose of prussic acid, for I am convinced that death would follow in either case. This is an illustration of what I mean.

Dr. Bogue.—My last chloroform patient was one who took a Lubin's cologne bottle, and put some chloroform in it. She sat down in a chair, poured a few drops on her handkerchief, and took the same. While those idiosyncrasies exist, the question would arise in regard to other cases. There are a large number of these that we may expect would suffer no inconvenience.

Dr. Marshall.—I have for many years discarded the use of chloroform for dental operations. In my early practice I used chloroform frequently until I had to take a lady patient and hold her, head downward, to save her life. So I have used it sparingly since, except to little children for operations on the mouth in hare-lip or cleft palate. In these operations vomiting must be avoided, and chloroform gives the best results in this particular. In the use of ether, vomiting is likely to occur, even though you use morphia and atropia combined. Children take chloroform well, but the great danger from its use is the upright position. It is never safe in this position. The action of the chloroform is upon the brain. It produces anæmia of the brain, followed by syncope, and gradual paralysis of the pneumogastric nerve. When this stage is reached, the pumping force of the heart is materially lessened, and it cannot

keep the brain supplied with blood, and the patient sinks. If the patient is laid on the table, gravitation carries the blood to the brain, and lessens the work of an already weakened condition of the heart's action. You may have read Dr. Meigs's criticism on the use of chloroform during labor. He says a great many patients insist upon sitting up as soon as consciousness is regained; the consequence is, they faint, heart clots are formed, and death supervenes.

Dr. Watkins.—I would like to ask Dr. Marshall a question. Is it not a fact that deaths occur more frequently where chloroform is administered in minor operations than in severe ones?

Dr. Marshall.—If you will say dental operations, in place of minor operations, I will answer yes. A large per cent. of the deaths under chloroform have been for minor operations, and a very large majority of them have been dental operations. For the mere lancing of an abscess under chloroform, if the patient is lying down, there is comparatively little danger. It is the upright position in these cases that does the harm. Profound anæsthesia is less dangerous than partial for any operation.

Dr. Jarvie.—I would like to ask Dr. Marshall if he would consider himself justified in using chloroform in dental operations?

Dr. Marshall.—I do not administer chloroform unless my patient is lying flat upon the table or bed. And rarely use it except for operations upon little children and those cases in which there is serious disease of the kidneys.

Dr. Dwinelle.—When chloroform was first introduced, we gave it for all kinds of operations, for minor as well as severe ones, and considered ourselves safe in doing it; but, latterly, chloroform seems to have exceptions to its rules and almost to have become an idiosyncrasy itself. I think I referred to a certain case I had the other day. It became very important that I should extract a tooth for a lady, the wife of a physician, and she insisted upon taking chloroform. I felt justified, under the circumstances, in coinciding with her, although her husband was opposed to it. We gave it to her. The last time her husband had seen chloroform administered was to a young lady who had died from its effects. The operation on his wife was successful. Chloroform has either differed in its character or in its effects. I notice abroad, out of compliment to Dr. Simpson, of Edinburgh, the discoverer, chloroform is used very generally, while ether is not so much as here. One is regarded as a European affair, and the other as an American. I never hesitate about using chloroform when it is indicated, but always, of course, with precaution and having proper remedies at hand.

I want to say a word in regard to the paper, which I commend most heartily. None of us could question its teachings; it is self-evident in all of its propositions. We need more recreation; we need to avoid the shocks upon patients and upon ourselves. We need more rest; and that reminds me of what Dr. Marshall told me this very evening,—that Dr. Allport takes a half-hour's rest at one o'clock every day, no matter what the circumstances that surround him. He has the happy faculty of dropping to sleep for half an hour, and waking up refreshed. With reference to what we may derive from our patients, and the disadvantages of contact that we are subjected to, it occurs to me how many of our friends in the profession have died from cancer of the stomach.

Dr. Marshall.—There is one thing I forgot to say about chloroform. In my hospital work, a great many cases are there for other troubles, and when they require my services I have the patient laid on the operating-table, and extract the teeth. I have no trouble when they lie that way, but there is an exception to the use of ether in certain cases, and that is where we have kidney troubles, as Bright's disease or diabetes. If it were a small operation, I should use neither ether nor chloroform, but nitrous oxide; but if a long operation upon such a subject, I should prefer chloroform, and not think of ether.

On motion of Dr. Francis, the thanks of the Society were tendered to Dr. Marshall for his kindness in coming so far to present this very able paper.

Dr. R. C. Brewster.—I desired to get some information in regard to the sulphate of morphia, which, I think, the doctor spoke of having used to help patients endure long operations. If I heard correctly, he said he was in the habit of giving a quarter of a grain. I would like to ask how he uses it, hypodermically or by the stomach.

Dr. Marshall.—By the stomach, with whiskey.

Dr. Brewster.—At the last meeting a gentleman, who was a member of the Society, made the statement that he was in the habit, whenever he saw a patient looking pale, of giving a hypodermic injection of that amount of sulphate of morphia without the slightest hesitation, and making no distinction. That may be all right; and I think the practice no doubt is good in the hands of men who are able to make proper discriminations; but perhaps it would be well if some one would raise the voice of admonition against its use, as it is such a deadly drug. Will Dr. Marshall tell us as to when not to use it?

Dr. Marshall.—I should not give that amount to a child. I mentioned one case in my paper of a lady who was a frail, delicate woman, about twenty-seven years old, to whom I gave it regularly. To some people it would not be necessary to give more than an eighth of a grain, but no harm could come from even a quarter, administered in that way. One-half grain is the maximum dose, and no one should take more. A quarter of a grain will make most people drowsy, but that is the effect we want.

Adjourned.

JOHN I. HART, D.D.S.,
Editor New York Odontological Society.

AMERICAN DENTAL ASSOCIATION.

August 7, 1891.—Fourth Day.—Morning Session.—(Continued.)

MEETING called to order at 9.45.

Dr. Peirce offered a resolution, which was adopted, that the Association direct that sections belonging thereto shall, in the future, be prohibited from inviting individuals who are violating the code of ethics from holding clinics, or giving other exhibitions, in this organization. Section III. was then passed.

SECTION IV.

HISTOLOGY AND MICROSCOPY.

Dr. Abbott read the report of the section, in which he says that one paper has been referred to the section, by Professors Carl Heitzmann and Frank Abbott, of New York, entitled "Senile Atrophy of the Upper Jaw."

Following is an abstract of the paper:

With advancing age the human organism is reduced in size and weight,—the more so after the threescore years and ten have passed. The whole body shrinks, as well as the tissues. Age itself is a disease. The old Roman proverb says that the aged return to childhood, mentally and physically.

The question we have tried to solve is,—In what does this atrophy consist? Through the kindness of Dr. Paine, superintendent of the Insane Hospital in Westborough, Massachusetts, we came into possession of the upper jaw of a woman who died at

the age of seventy-five years. It was placed in a half-per-cent. solution of chromic acid, in which it remained several weeks, for the purpose of softening the bony parts. The whole thickness of this jaw was not more than from four to five millimetres. It was perfectly smooth.

Let us consider the senile changes of the tissues involved in the formation of the upper jaw.

First, epithelium.—As mentioned before, the layer of stratified epithelium has been considerably reduced in bulk, although its constituent portions are still recognizable.

Second, fibrous connective tissue.—The senile changes are explained only by the fact that protoplasmic bodies lie between the fibrous connective tissue, which are traversed by a net-work of living matter. These bundles are possessed of life, therefore, as well as protoplasm itself.

Third, blood-vessels.—The fibrous connective tissues are freely supplied with blood-vessels during the ascending period of life, while they hold surprisingly few in advanced age. Smaller arteries show an augmentation of the nuclei to such an extent that the spindles of the muscle fibres become replaced by rows of minute globules.

Fourth, nerves.—Here and there we meet with medullated nerves, recognizable by their connection with other nerves which exhibit striking changes. Such changes are usually met with in the process of neuritis, but as this is not present in this instance, they must be attributed to senile changes.

Fifth, cartilage.—The appearance of hyaline cartilage in a senile jaw is a most surprising fact, going far to prove that rejuvenescence of the tissues takes place in old age.

Sixth, bone-tissue.—After individual teeth have been lost, their sockets after a while disappear, and when all the teeth are gone, the whole alveolar process fades away. This process is known by the term absorption, but we are not satisfied with the idea conveyed by this expression, for it is evident that a hard, tissue-like bone cannot be so easily disposed of. It must first be reduced to its protoplasmic condition, which can be disposed of more readily. The results of our studies in this direction fully justify us in stating that such changes do take place.

It is a fact that, in advancing age, the bone-corpuscles become less in number, the reason for which is that many of them are transformed into basis substance.

All tissues arise from protoplasm, and all tissues return to this

embryonic state before their absorption. Origin and decline show a striking similarity, and what is between the threescore years and ten is struggle and change of the whole person, as well as of all its constituent parts, the tissues.

DISCUSSION.

Dr. Hunt.—It seems to me that this paper is a very valuable one. So far as I know, this is the first effort that has been made to demonstrate the destruction or wasting away of the bony tissue in the same line of investigation that has formerly been taken up in regard to the softer tissue. It is well established, I believe, that the process of destruction is a retrograde one, in full keeping with that of formation. This brings out the same idea as applied to bone-tissue. I have long been of the opinion that much of the investigation of this character was carried on more for the purpose of finding new laws than endeavoring to discover something like a universal law for the government of protoplasm both in building tissues and tearing them down. Therefore, I think this paper is very valuable in this respect. I presume it will lead to further investigation in that direction.

Dr. Ingersoll.—I will say that I have been more interested in Dr. Abbott's paper than any one I have read on histological subjects for many years. It preaches a practical fact, which every operator is brought in contact with nearly every day. We wonder what becomes of the tissue when we see it wasting away. What is absorption? I believe that we shall be obliged to come to this conclusion: that the functions which build up and afterwards tear down the tissues are the same. We see that in the case of absorption of the temporary teeth, and whatever the process may be, it is the same, I believe, in both instances. That of absorption is first a process of solution. There is no such thing as eating down the bone, but there is first a solution or return to a condition of solvency, and then absorption is an easy matter; but not until then. I must express my great satisfaction in other respects, in regard to histological observations in general. When we are called upon to explain a fact, and to seek for that explanation by the microscope, we must go right back to the embyronic condition. We are dealing with the perfected tissue, and that is a very different kind from the embryonic, in every instance. The brain-tissue of the infant is not that of the man. How then can I understand the brain-tissue of the man from microscopical observation of that of the child? Suppose I am a wood-worker; I want to know the

nature of the oak. I ask my friend about it, and he says, "Here is an acorn; this is the embryonic oak." He has not given me what I want to know. I want to know why oak is more enduring than pine, or any other wood. I cannot understand from the embryonic condition at all. I cannot know very much about a hen from the egg. I do not want the embryo. We can best understand by going back to the first stages of tissue.

Here is a paper which is a thousand times more valuable than embryonic investigations. It has taken the mature tissue, and we want more of that kind of investigation. There is one point I did not quite understand. How is it, if the senile condition is a return to the embryonic, that the bone is so pliable, compared to what it is in childhood? If there is a return to the cartilaginous condition of the bone and protoplasm, why is it that the bone is so fragile in old age?

Dr. Abbott.—I will endeavor to answer that question. The bone-corpuscles, of which there are many in the bones of young and middle-aged people, as they grow older, are converted into their embryonic state; and those medullary bodies take in lime salts, which eventually fill the bone-corpuscles. Thus it becomes solid, as compared with what it originally was. It is simply converting the bone-corpuscles into bone itself, by the processes described in the paper.

Section V.

MATERIA MEDICA AND THERAPEUTICS.

Dr. Harlan reports that Section V. has only one paper, by Dr. Marshall, of Chicago, entitled, "Electricity as a Therapeutic Agent in the Treatment of Hyperæmia and Congestion of the Pulp and Peridental Membrane."

The following is an abstract of Dr. Marshall's paper:

I have chosen as the special topic of this paper two out of several important pathological conditions of the teeth, to which the various forms of treatment by electricity may be beneficially applied.

Hyperæmia and congestion of the dental pulp from caries, thermal shock, chemical and mechanical irritants, and traumatic injuries, etc., resulting in odontalgia, are among the most common of the diseased conditions found in the oral cavity, and many times the most difficult to control by the methods of treatment usually adopted without devitalization of the pulp.

The object, of course, in the treatment is to relieve the congested

condition of the blood-vessels and to preserve the vitality of the pulp, and to arrest the inflammatory symptoms short of the suppurative process, or of the formation of adventitious tissue or new growths.

How these much-to-be-desired conditions can be obtained is a question that has often troubled the mind of the thoughtful dentist; and while I do not claim to have made a new discovery, I am confident that the galvanic current, if judiciously used, will prove to be a valuable aid in the treatment of certain forms of inflammation of the pulp and peridental membrane.

The pulp of the right first superior bicuspid in the writer's mouth becomes congested. It was determined to try the depleting effect of the positive galvanic current. The positive pole of the continuous galvanic current was applied to the tooth, and the negative pole to the carotid triangle of the neck on the same side. The strength was graduated to my ability to bear it without discomfort, and the poles were allowed to remain in position for about a half-hour. At the end of ten minutes there was a marked improvement in the symptoms, and at the end of the half-hour all discomfort in the tooth had disappeared.

The marked success which followed the treatment of this tooth has led me to adopt the same in several similar cases, and all but one of which have responded to my entire satisfaction.

In the treatment of pericementitis, not caused by septic poisoning from a devitalized pulp, it is many times of very great benefit. In these cases the positive pole should be applied to the gum over the roots of the affected tooth.

In a former paper I have called attention to the prevalence of hyperæmic odontalgia frequently accompanying pregnancy. I would suggest the local application of the positive galvanic current to the affected teeth.

As a rule, one treatment in twenty-four hours is all that will be required.

As a means of diagnosis in obscure cases of the vitality or non-vitality of the dental pulp, I know of nothing so sure to demonstrate to a positive certainty these conditions as the electrical currents, both the galvanic and the faradic. In the more obscure cases the faradic is superior to the galvanic. I also believe that the electric current will serve to demonstrate the presence of low grades of inflammation of the tooth-pulp. The diseased tooth will give a more active response to the current than will the healthy tooth.

DISCUSSION.

Dr. Frederichs.—Is there not some mind-cure in this? You may laugh, but there is some truth in my remarks. The mind has a great effect on the result of cure. The reason I arose to speak about it is that it will cure sometimes. I had that illustrated in myself. I have been a sufferer from lumbago. The first time electricity cured it in about two weeks; but we know by the general tendency that I would have gotten well in about six weeks without anything, because all diseases have a tendency to cure themselves. I know of one instance where electricity was applied by a physician in order to relieve toothache, because he was a sort of monomaniac on the subject. He even had his battery brought from Europe. I know positively that he applied it to relieve his patients of toothache. He did not succeed, and he finished by the injection of an extra grain of morphine. I believe electricity is a good thing, and, if I adopt anything that has been illustrated here, I shall certainly apply that relief to patients in my practice; but what I wanted to add to my remarks was that the remedy, when applied a second time in my own case, had no effect.

Dr. Abbott.—The little instrument that is passing round, exhibited by Dr. Marshall, reminds me that some years ago I made one of a similar kind, only the back end of it was a bow instead of being brought together by a rubber arrangement as that is. At each end there was a cup, facing each other, the same as that. It was about three-quarters of an inch in diameter and nearly half an inch in depth. In each of these I packed a sponge, and saturated it with this mixture:

℞ Tinct. aconiti rad.,
Chloroformi,
Alcoholis, āā ℥i;
Morphinæ sulph., gtt. xii. M.
Sig.—To be used as a local application.

I used it for extracting teeth. I held it against each side of the tooth; and you can extract teeth as fast as you please successfully. It just occurred to me, and I thought I would make mention of it.

Dr. Frederichs.—What is the object of adding alcohol?

Dr. Abbott.—All those things tend to one thing,—anæsthesia. Some gentlemen understood that I used electricity with this. I did not; but I think electricity would intensify the action of any material of this kind very much. By using it you can produce

ne effect in a very few moments. Surgeons use the electrodes for rcing an antiseptic into such place as they wish.

Dr. Horton.—In carrying out this idea of the application of elec-icity to reduce inflammation, I would say that my son has pre-ared an apparatus by which he overcomes all sensitiveness in the entine in excavating preparatory to filling teeth. He is not in a osition to make any illustrations here, but I hope that at the next eeting of this society he will be there to show you what he can o, so far as excavating teeth by electricity is concerned. He has sed it on perhaps one hundred patients very successfully. I ope he will soon be able to put it into the hands of any one of rdinary intelligence, and the dentist will not be obliged to have bottle of medicine standing next to him to relieve sensitiveness f dentine.

Dr. Hunt.—I would like to ask the essayist exactly what he eans by the use of the term "embolus" in relation to the pulp?

Dr. Marshall.—I mean by the term what is generally understood y dentists. I mean a clot of blood which has formed, and that he arterial supply has been plugged up, probably by some little lobule or fibre, or by the formation of a blood clot.

Dr. Frederichs.—I certainly was pleased with Dr. Marshall's sug-estion. We all know that electricity—although it has been used edicinally for some time—is still in an experimental state. As far s we know, there is really no definite ideas upon which to base its pplication. It requires a great deal of original investigation of ese matters to get them perfect. I do not believe in tabooing ything that has the least show of being productive of good. In gard to emboli, I cannot conceive how, in a case of that kind, ectricity would be effective.

Dr. Marshall.—It did not do any good.

Dr. Morgan.—Perhaps I know less about electricity than any an in the audience, but for the last four or five years I have had eat difficulty in my locomotion. I have a bad case of rheu-atism, with a touch of gout. A man came to me one day with a all piece of wire with two bowls attached to it. One of these he oposed to attach to my person. I was then walking with great fficulty, with a crutch and a stick, and I had to have both these ds to get across the floor. I put it on, and was enjoined not to ke any medicine. It has stood by the side of my bed, and I have ed it ever since. In about a week or ten days I began to sleep ittle better, and the pains began to subside, and then in about ree months, wearing it every day and every night, that foot be-

gan to get a little better. I wore it almost constantly from that tim up to the present, and am able to walk alone now. I am fre from pain, can sleep like a baby, my digestion is good, and th trouble with my heart, from which I suffered for a long time, ha passed entirely. Here I am in my seventy-third year, and I think I will be able to throw away the crutches. That is what I know about electricity. Although I am not restored entirely, I feel tha it has done me a great deal of good. I could not fix its value i dollars. I give that as an illustration of the value of this agent I do now know what it is. Our experts at Nashville took it dow to examine it, and they say there is no electricity whatever in tha instrument. It does some very wonderful things. In one case i caused the healing up of some ugly ulcers that were of at leas thirty-five years standing, in seven weeks.

Dr. Abbott.—I would like to emphasize what has just been sai by Dr. Morgan. He has had some very wonderful results from it You could not buy that instrument from him for any amount o money. I think the man who makes them lives in Birmingham Alabama.

Dr. Shepard.—I merely want to say that I have no doubt, fro the testimony of the most reliable people that lived, that there is a the bottom of these cases, and many others, the same great princ ple of mind influence. We all know a pretended medicament i frequently as efficacious as a true one. When the most intelligen and educated people in our communities are firm believers an practitioners of Christian Science, and the kindred things, we mus admit that they are not lunatics, but that there is some principle i it which is not yet fully understood. We are on the threshold c some great truth, which misleads us when we do not understand i and makes us think that the medicines we use are good and usefu We might as well take these things into account and avail ourselve of them in our practice, and when better understood, they will pe haps explain the multitude of clever things that happen.

Dr. Marshall.—This discussion has taken a very wide range, an it would take me a good while to answer all the points. Dr. Fre erichs and Dr. Shepard have thrown out the suggestion that pe haps this idea of electricity being beneficial in the treatment disease was owing to the influence of the mind, that it was partl a mind-cure. Now, these gentlemen are not serious, certainly, wh they make these statements, because we know we can reduce ce tain forms of tumors in the human body by the action of the pos tive galvanic current. That point is settled. It stimulates th

sorbents, and in that way the tumor is carried away. There is nother point that I brought out in my paper. That is the produc-on of hyperæmia on the surface of the body by the application the positive galvanic current, and the reverse—anæmia—by the gative current. You can drive the blood out of a part of the dy, or you can bring it in. Any one can test that, if he has a ttery. When I first commenced these treatments, I used my st finger as the electrode. I could not leave it there more than out five minutes before the current decomposed the water and e secretions under my nail, until it began to smart so that I could t stand it.

I might have recited several cases in support of my theory. I ought if I gave you one that was successful and one that was a ilure, it would illustrate the point. A lady in Chicago, who is a ysician, living on the north side, and who is one of the most lented women in our city, had this experience; in the excavation a cavity in a bicuspid tooth, one of the horns of the pulp was ghtly exposed, and her dentist filled it with oxyphosphate cement. was not odontalgia; it was that low, grumbling movement that ade her think every moment the tooth would begin to ache. That as a condition of hyperæmia. I suggested electrical application, d she said she had no faith in that. I persuaded her to use it, and less than half an hour that tooth was quiet. She came back and ld me that the tooth had troubled her again; she said she had ken some hot coffee, and that had annoyed the tooth. I tried e current again for three days, one sitting a day, and it has ended. e has come back at different times, and the pulp is still alive. I pe to save it, too. It is in cases where you find the first stages hyperæmia, where it will probably go on and end in the destruc-n of the pulp, if let alone, that this is valuable. In those cases will relieve the hyperæmia and save the tooth.

Dr. Abbott spoke of the introduction of medicaments into the lp. There are experiments being tried in regard to that. I have ver tried it, but before I left home that matter was brought up me in a conversation with Dr. McIntosh. We applied some utions which we used, to see if we could get the medicament into tissues, so as to get a more rapid action. I thought this could done, and I proposed trying it.

Subject passed.

Dr. Truman stated that Dr. Stebbins had his son present, to w the action of nitrate of silver on deciduous teeth.

Dr. Stebbins.—I will state the manner of procedure that I have

had under consideration for several years, and that was to arrive at some method by which we might save the temporary teeth without cutting or hurting them. I have taken the crystals of nitrate of silver for the work, and pulverized them, because there is less impurity in them than in the sticks. The nitrate of silver forms a compound with the albumen in the fibres. This compound is dissolved by very few substances. I start out with that. The salts are very hostile to microbes, almost as much so as mercury salts. The time to take it is when the teeth begin to decay. I have found it effective on labial and buccal surfaces of teeth. When this boy was three or four years old, he complained that he could not brush his teeth, because they hurt him. I tried the application to the buccal surfaces. That was six years ago last March. They have not been touched since. The approximal surfaces were treated in 1887. I have touched those two or three times. I have treated many teeth not only temporary but permanent. I pulverize the agent in a mortar, and then take a wooden point, and having it moistened enough to have the crystals stick to it, apply it to all the parts of the tooth. Do not be afraid of getting too much in. In February and March, 1888, I took a number of children out of the primary schools and asked them to have their teeth treated in this manner. In May, 1891, I examined one hundred and twenty-four cavities, and found eighty-four where the treatment was successful.

MISCELLANEOUS BUSINESS.

A vote of thanks was offered to the Local Committee of Arrangements, and especially to Dr. A. C. Rich, for the efficient service rendered in making the stay of the Association a pleasant one.

Final reading of the minutes.

Drs. McKellops and Abbott were appointed to conduct the newly-elected president to the chair.

Dr. Walker.—Mr. President and members of the American Dental Association,—I feel deeply the honor you have conferred upon me in electing me as your presiding officer for the coming year, and I will promise to fill the position to the best of my ability.

On motion of Dr. Abbott, Dr. Corydon-Palmer was allowed ten minutes to proceed with his remarks on operative dentistry.

Dr. Corydon-Palmer.—For the past few years I have not attended the meetings of this society. The American people, as a nation, are being disgraced by having their mouths filled with gold. You will see a whole row of inferior incisors capped with gold. I want to urge upon you to stop this practice; it is discreditable;

it is unnatural; it is unsightly; it is bad taste. Try to get along without it.

What I have been grieved about most is the treatment of children's teeth, where there has been necrosis, and, as far as I know, there is not enough knowledge upon that subject. You do not take pains enough to instruct the students in this branch. I have been shocked and grieved in the colleges where I have been to see the students at once extract the teeth. You must not do it. There is more harm done to the development of the teeth by interfering with the deciduous teeth than in any other way. You get deformity and want of development and irregularity. You must not extract them. Treat them; take care of them.

Those two subjects have impressed me so strongly that I felt I must say something about them. I hope each one will, as far as possible, endeavor to influence others to not interfere with children's teeth, and where a young mother or any person brings a child to you, treat the teeth instead of extracting them.

Dr. Floyd.—I would like to say one word. I came here from Kansas as one of the delegates, and as a member of this society, and I feel I have learned a great deal since I have been here. I have heard some very valuable papers, and I hope they will go out to the community as bright and shining lights.

Adjourned.

AMERICAN ACADEMY OF DENTAL SCIENCE.

The regular monthly meeting of the American Academy of Dental Science was held at the Boston Medical Library Association rooms, on Wednesday, January 6, 1892, at 7.30 P.M., President Brackett in the chair.

Papers were read as follows: By Dr. H. F. Hamilton, subject: "Description of a Case of Regulating."

(For Dr. Hamilton's paper, see page 416.)

By Dr. E. G. Tucker, subject: "History of Dentists who have graduated under Drs. Harwood and Tucker."

(For Dr. Tucker's paper, see page 348.)

DISCUSSION OF DR. HAMILTON'S PAPER.

Dr. Meriam.—I would like to ask Dr. Hamilton whether the wisdom tooth erupted?

Dr. Hamilton.—Not until several years after the regulation was completed.

Dr. Meriam.—Was there much movement in the lower jaw? Was it possible for the patient to throw his jaw much forward?

Dr. Hamilton.—I should think he had rather less than the average movement.

Dr. Banfield.—Was the plate changed from time to time?

Dr. Hamilton.—Yes, the plate had to be changed, because it was rapidly worn away by the closing of the teeth. In four months' time I made three or four plates. At first I intended to make metal plates, or to put on the rubber plates metal caps, but I found that rubber was easier to shut into, so I let the patient wear out one plate and then made another.

Dr. Andrews.—How deep were the depressions on the plate?

Dr. Hamilton.—About an eighth of an inch; deep enough to get a firm hold on the occluding teeth.

Dr. Baker.—I should like to ask Dr. Hamilton if both of these plates were worn at the same time.

Dr. Hamilton.—No; they were worn alternately.

Dr. Clapp.—I understood Dr. Hamilton to say that the second molars were not covered with the plate, and after they had come into position the patient could not shut the mouth in the old way. I would like to ask if, before the plates were taken off, the second molars had come down in the way he designed that they should?

Dr. Hamilton.—They came on a line with the others; they all came together.

Dr. Clapp.—It seems to me that is one of the practical points of the case,—allowing the second molars to come into position.

Dr. Robinson.—Could you not have jumped these teeth far enough forward at one jump?

Dr. Hamilton.—No; I should not think it advisable.

Dr. Meriam.—With regard to Dr. Tucker's paper, I want to say one word. I have said the same thing before, but I think perhaps it had better be in the presence of Dr. Tucker, and that is, that there must be among the archives of the Tuckers and the older dentists many of the earlier formulæ of dentistry, one of which he has referred to, and it seems to me that it is a good time to inaugurate a movement for the publishing of those formulæ, now that we have a journal that is willing to print interesting matter of this nature.

Dr. Baker.—Here is a tooth which is of interest; it was given to me by a lady about ten years ago, and she told me that it was filled

by Dr. Joshua Tucker forty years before that (*i.e.*, 1840). The man from whose mouth the tooth came has been dead about ten years, and it is such an old affair, I thought I would bring it here this evening.

REMARKS BY DR. CLAPP UPON "COMBINATION FILLINGS."

Dr. Clapp.—The subject of combination fillings is one of great interest to me, and in looking over my records I find that the percentage of these in proportion to the whole number of fillings that I put in is very great. I believe that not one in ten realizes the practical utility of such fillings in the saving of teeth, and I doubt very much if one in twenty uses them to any great extent.

If the teeth are young or old, and of poor quality, to my mind it is much better to put in a combination filling of cement and gold than to fill entirely with gold. Of course, we have all been in the habit of lining up cavities with cements and filling them with gold afterwards. This is a practical and valuable method, and the principle may be extended very materially.

I have been in the habit for some time of putting cement into cavities, and, while the cement is soft, placing plastic gold right into it. By so doing, the gold of itself obtains the necessary retaining points; whereas, if you put the cement in and allow it to harden, then you must re-excavate and form undercuts to hold the gold. In crown cavities, for example, where the central portion of the tooth is largely decayed, but the overlapping enamel is still sufficiently strong to withstand the force of mastication, either amalgam or gold can be put in, and the surplus cement which is squeezed out by forcing the gold or amalgam into the cavity cut away. After waiting a minute or two for the cement to harden, the filling can be burnished with gold or amalgam, as the case may be. It seems to me that in many cases these fillings are better than if they were made of one material. We find oftentimes in connection with a large cavity on the mesial surface of a molar, a small pin-head cavity in the distal surface of the adjoining bicuspid. My experience is, that if I fill these smaller cavities with gold, decay will reappear, and the fillings tumble out.

In such cases I often use tin and gold, a combination which you have heard advocated by Dr. Hamilton and Dr. Briggs, and which was spoken of many years ago in an article by Dr. Abbott, of Berlin. It is very serviceable in the crown cavities of sixth-year molars, also in buccal cavities, and in the temporary teeth. The statement which has been made here by Dr. Hamilton and others,

that these fillings after a time become hard, something like an amalgam filling, is a fact, which I have demonstrated many times in my own practice. One advantage of the combination of tin and gold is that it does not discolor the teeth, as amalgam. As to the use of amalgam and gold, I know that my combination of these materials lasts longer than the all-gold fillings which I formerly inserted in similar cases. Oftentimes, in talking with dentists, I ask them if they use this combination, and they will say "yes," and then remark, "Do you use a matrix?" Thus showing that they have no idea of the proper manner of putting in such fillings, and, consequently, no idea of their value in saving teeth. To correct such false ideas is the reason for my appearing before you to-night.

The use of cement and gold in the front teeth is, to me, a very important affair. Without first putting in cement in the case of large cavities, or moderately large cavities in the poorer quality of teeth, I feel that the chances for permanent success are small. Cavities in frail teeth, where it is difficult to obtain a good retaining shape, can be filled with gold and cement, and the cement will assist very materially in retaining the filling.

In large cavities, if we can have a considerable proportion of the filling cement, we have a better filling, as there is less metal, and the cement will adapt itself better to the tooth than any other material. Here are specimens showing the method of putting in these fillings. This one shows a large approximal cavity in a molar. If a matrix is adjusted and cement placed in the cavity, and, while it is soft, amalgam inserted, the cement will be crowded down next to the matrix, and, consequently, the edges of the cavity will not be completely protected by a metal. To overcome this, I put in the cement before putting on the matrix; then add a little amalgam, thoroughly incorporating it with the cement; then trim off around the cavity so that the edge towards the matrix is entirely exposed; then put on the matrix, and finish with amalgam or gold. In other cases I find it convenient to put on the matrix, and put a little amalgam next to it; then fill the body of the cavity with cement, and finish with amalgam or gold, or both, as the case may be. The large filling in the lateral incisor, which has been passed around for your inspection, and which, you will remember, is quite large,—restoring the contour of the distal portion of the tooth,—was made in the following manner: The cavity was prepared so that there was considerable undercut at the cervical wall; there was a very slight undercut towards the point. Cement

was first put in; then plastic gold crowded into the cement; *but the gold did not go into any retaining point whatever.* After waiting a few minutes for the cement to become hard, the filling was finished with odd lots of gold that I picked up around the office, and with an extra hard blow of the automatic mallet. My idea was to see if the blow from the automatic mallet would break up the cement and prevent its being strong. Now, I want this filling tested. I may suffer a great disappointment to-night, because I don't know how strong the filling is, and it is possible that the gold may have no retention at all in the cement; but I do know that the mallet was put on very much harder than it would have been if the filling had been in the mouth, and the filling was very thoroughly finished with burnishes, plate-files, disks, and stones.

[The tooth was then given to the President, who removed the filling with strong excavators, and stated that, in his opinion, it was more firmly held in place than would have been possible in such a cavity without the use of cement.]

After seeing the pressure it required to break out this filling, I think I should dare trust it in the mouth. Of course, in filling these cavities, you are laboring under unfavorable conditions.

Dr. Ainsworth.—I would like to ask Dr. Clapp if the plastic gold was annealed before it was put into the cement.

Dr. Clapp.—If the bottle of plastic gold has been open any length of time, I usually anneal it; then put it into the cement, and crowd it in with a large instrument. A sufficient time must elapse for the cement to harden. After the cement has become a little hard, the plastic gold, inserted in one or more pieces, must be thoroughly consolidated with proper instruments. Then the filling can be finished as though no cement was there at all, using either plastic gold or foil.

The cement that I have used for five or six years,—perhaps even longer than that, up to within about six months,—has been Weston's. I have used it with a great deal of satisfaction; but, just before the summer vacation, it became so unmanageable that I had to give it up.

I then got some of Dawson's cement, and have used that a little since; but in my hands it is not satisfactory. I think it is a pretty strong cement, and for lining up cavities it will do very well. Years ago, before trying Weston's, I used Fletcher's porcelain cement, which, it seems to me, was the best I ever used. That, after a time, became cranky, the liquid becoming hard so quickly, after a fresh bottle was opened, that I gave it up. This autumn, after having

had an unfavorable experience with Weston's cement, I wrote to Dr. Lewis, of Buffalo, who is the American agent for Fletcher's filling-materials, and asked him if he had Fletcher's porcelain cement, and if it was in good working order. In reply, he sent me a package of it, and I find that it works the same as it used to, and it seems to me to be a very good cement. Some of its qualities are these: You can mix it very thin for crown-work, etc., and it will set very hard. It is a rather slow-setting cement, and you can use it very nicely, even after it is quite hard. It then works like dry amalgam, and with an oil-burnisher takes on a fine polish.

Dr. Mead.—I would make a suggestion with regard to cements: the powder, when of long standing, absorbs moisture which somewhat impairs its virtues. It can be restored to its original condition by heating in a porcelain dish over a sand-bath.

Dr. Clapp.—I would like to speak of another thing in regard to plastic gold, and that is its great value in commencing fillings. I cannot resist giving you one demonstration of that fact. Here is a cavity on the buccal side of a molar, and you know sometimes these cavities are very sensitive, and it is difficult to get much of a retaining point. This cavity was prepared with an inverted cone-bur, which was put in and run right around in the cavity. There is no angle whatever in it. The walls are nearly perpendicular; the cavity is a little larger inside than out. The way I start such a case as this is to take a good-sized piece of plastic gold,—I use Steurer's usually for this purpose,—and with a large instrument pack it in, using a smaller instrument to carefully condense the gold about the edges. If the gold is fresh, I do not anneal it; otherwise I do.

Dr. Ainsworth.—Do you use copal ether or anything of that kind before starting the filling?

Dr. Clapp.—Sometimes, and, theoretically, it is the correct way, but I don't always do it.

Dr. Ainsworth.—Did you ever notice any leaking when copal varnish had been used?

Dr. Clapp.—If it is used very thin, so thin that the preparation looks like water, it doesn't seem to me that there can be any trouble from that.

Dr. Parker.—Have you ever used Williams's plastic gold?

Dr. Clapp.—Yes, but I have never found any gold that has the quality that Steurer's has. And the special quality that makes this gold valuable in such cases is that when you put an instrument onto it, it is like pushing your finger into a snow ball; it only condenses that which is directly before it; but if you put your finger

into a ball of cotton, it pulls a great deal along with it. This gold is absolutely without fibre; it condenses before your instrument, like soft snow. I use plastic gold for commencing nine out of ten of the fillings that I put in. I don't care whether there is more waste or not; if I can save five minutes' time, that pays for the waste gold.

Dr. Ainsworth.—Do you ever commence with foil?

Dr. Clapp.—That depends on where the filling is, and how I can get at it. For the particular point in the cavity that I am at work upon I use that which I think will best serve the purpose. I use the various forms of gold interchangeably.

Dr. Ainsworth.—Without any hesitancy in regard to cohesion?

Dr. Clapp.—Yes, I have had no trouble whatever on that score.

Dr. Eddy.—Have you ever noticed that certain foils adhere more readily than others?

Dr. Clapp.—I have not thought of that particularly. I use, mainly, Morgan and Hastings's semi-cohesive foil.

Dr. Potter.—Would you consider it good practice to complete the filling with plastic gold?

Dr. Clapp.—Certainly.

Dr. Payne.—Do you find that plastic gold will burnish as well as cylinders or foil?

Dr. Clapp.—It burnishes, I find, exactly as well. I think it harder than foil when finished.

Dr. Taft.—The subject of combination fillings is always one of interest to me, and I feel under great obligations to Dr. Clapp for what he has shown us to-night, much of which I shall put into practice.

My experience with compound fillings began at the time Steurer's gold was introduced, and it has since that time been limited almost exclusively to amalgam and gold. Scarcely a day passes that I do not have occasion to insert one or more of these fillings, and I find them particularly valuable in large crown-cavities in molars, as well as in compound cavities when the matrix is used. After first making the cavity thoroughly antiseptic, my practice is to coat it with a very thin solution of sandarach varnish. By so doing the tubuli are closed, so that mercury is not expressed into them when force is applied to the amalgam, which should have as little surplus mercury as possible.

While I am not sure that compound fillings save teeth better than fillings made entirely with gold, I do know that this method saves time. In large crown-cavities in molars, for instance, where

by other methods of insertion and finishing a filling will take an hour to perform, the time can easily be reduced by this method to ten or fifteen minutes.

My practice is to fill the cavity to within about an eighth of an inch of the top with amalgam; then carefully to work Steurer's gold into the amalgam, using broad points at first, then finer ones. I next use Watt's crystal gold, and finish the filling with foil or pellets. Thus we do away with all unnecessary undercuts, and reduce the time and fatigue of the operation to a minimum.

Dr. Meriam.—There is one filling which ought not to be lost sight of. It was introduced by a dentist of Brooklyn, N. Y., and consists of cement to which an alloy has been added. The durability of the cement is thus increased. Dr. Howe has given it as his opinion that there is something more than a mechanical union existing between the cement and alloy; there seems to be a chemical union, and the result is a greater resisting power against solution.

We have never failed in the mechanical work of filling; we can make our fillings stay in; we can make amalgam stick to gold, or gold stick to amalgam, and still be no further advanced than we were before, unless we impart to them a therapeutic action, or in some way prevent the edges of amalgam fillings from standing away from the teeth. With tin, on the other hand, which possesses therapeutic value, I have not known of a case where there has been this trouble. It is a material that can be nicely burnished, and is so soft that it adapts itself well to the edges and remains there; and while the tin itself may discolor, its stain is so little that it seems preferable to the union of gold and amalgam. The union between tin and gold may not be as strong as that between gold and amalgam, yet it is sufficiently strong for the purposes for which it is used.

Dr. Banfield.—Does Dr. Clapp have any preference in regard to the kind of amalgam he uses?

Dr. Clapp.—I have for five or six years used almost excusively Caulk's white alloy. It has proved itself better than any previously used. It works perfectly well as far as the union with gold is concerned; in fact, I have had no trouble in that respect with any amalgam.

In regard to the use of amalgam and gold in crown-cavities, as spoken of by Dr. Taft, I never use it in that way, for this reason: I consider cement, where it is entirely covered with gold, far preferable to amalgam. To me, there is an objection to a large amount of metal in a tooth; but the larger the core of cement

the better the filling, to my mind. In large cavities, where there is an immense amount of amalgam and gold, there must, I believe, be some change of size due to thermal variations. This change in the size of a large metal filling may crack a frail tooth; therefore, I lay it down as a principle to put just as little metal as possible into a tooth, and still have enough for strength.

In regard to the amalgam creeping or crawling away from the edges, I have never seen it happen in the combination fillings of gold and amalgam such as I have described. Of course, I have seen many such cases where the filling was entirely amalgam. In one or two only have I seen decay reappear about my gold and amalgam fillings. I feel very much more confident of such fillings than I do of those made exclusively of either of these materials.

I thoroughly believe in using tin and gold. I often use these materials at the cervical margins in preference to amalgam.

Dr. Banfield.—I have used for a great many years what is called "Standard Alloy." It has given me better satisfaction than any other. I have recently seen some large fillings in molars extending from the crown to the approximal surface, and including some of the cusps. These fillings were made several years ago of "Standard Alloy," and are now in good condition; the edges perfect, and teeth well preserved.

Dr. Taft.—Since I have entirely discarded the use of silver alloys my combination fillings have been made with gold and copper amalgam. The result of my experience and observation with regard to silver alloy leads me to consider it the least desirable filling material that can be used.

Dr. Banfield.—Has Dr. Taft noticed any disintegration in his copper fillings? I understand that a number of dentists who have used copper amalgam have become disgusted with it, and have taken out all fillings made with that material.

Dr. Taft.—Occasionally I have found the disintegration mentioned, but it has almost always occurred in mouths where the secretions were of an acid nature, and where cement or gutta-percha fillings dissolve away very rapidly. The proportion, however, of cases where the fillings show disintegration or become cup-shaped is so small that I do not regard that objection as of any importance. If any of you have had occasion to take out copper-amalgam fillings, you will have noticed how much more dense they are than silver-amalgam fillings. Copper amalgam is used with very great advantage in cases of white decay, occurring on the buccal surfaces

of molars. If such cavities are filled with copper amalgam, a hardening rather than a continued softening takes place. When the patient presents himself at a later day you do not find a leaky filling, as very often happens when a silver alloy has been used.

Almost all of the silver alloys, to a greater or less extent, have the disagreeable characteristic of bulging out or shrinking away from the margins of the cavity, and I have become thoroughly disgusted with them, and have entirely discarded their use.

Dr. Banfield.—As I understand it, white decay is found in mouths having an acid reaction. Are not these mouths, then, really the most unfavorable for copper amalgam?

Dr. Taft.—I certainly do not think so. If I had found such to be the case I should have discarded copper amalgam altogether. I can only speak from my own observations. Where copper-amalgam fillings show a cup-shaped appearance, I attribute it more to the fact that the amalgam has not been put in as dry as it should have been, or else that it has been put in under moisture, and a part of it has come away after the completion of the operation.

Dr. Baker.—I would like to ask Dr. Clapp if he uses his gold and amalgam fillings in cuspids,—say the distal surface, or the mesial surface of the first bicuspid?

Dr Clapp.—I often use it in the mesial surface of bicuspids. I don't remember that I have ever used it in a cuspid. If I use it in the mesial surface of a bicuspid, I put it in so that it will not show on the labial side, filling the whole of the buccal or labial wall with gold, so that there may be no discoloration. I have used to some extent a preparation, by Williams, of platinum and gold. It is a platinum foil on which gold has been deposited, and I oftentimes put a piece of this against the wall, and then pack amalgam against it. I have not, however, used it sufficiently to know whether it will be an absolute protection against discoloration. But, if amalgam is likely to show at the cervical portion of the cavity, I only put it part way, and fill the exposed portion with gold.

Dr. Baker.—As a matter of fact, then, amalgam invariably discolors, and the dentine is stained unless the cavity is lined with some other material.

Dr. Clapp.—All teeth are not discolored, but some are. I think the quality of the tooth has something to do with it; but it certainly discolors teeth to some extent, and for that reason one must use his ingenuity.

Dr. Eames.—For the past twelve years, since Dr. Kingsley spoke of using gold and amalgam together, I have followed his

method, and have first filled with amalgam, and after it has hardened, removed a certain amount of it and completed the filling with gold. By this method I am able to control the shape of the filling as well as the amount of space which the amalgam is to occupy in the cavity. I am quite sure that when gold is placed in connection with amalgam, even though that has been in position two or three days, it controls subsequent changes in the amalgam. Such fillings do not crumble at the edges, or show the characteristic failures of pure amalgam. In very frail teeth I have allowed it to harden for the strength it would give, and then put in gold. At times, however, I use gold and amalgam, as Dr. Clapp has described; and join with others in thanking him for the admirable talk he has given us on this subject.

Dr. Clapp.—I have used copper amalgam a very few times. So far as I know, none of the fillings have dissolved out to any great extent; but they have become of such inky blackness, and the tooth itself has become permeated with the stain to an extent that I have never experienced in connection with the silver alloys.

Dr. Taft.—It is curious how experiences differ in regard to the use of different materials. Meeting Professor Putnam, of the Peabody Museum of Archæology, at Cambridge, one day, in the course of our conversation the subject of copper-amalgam fillings came up, and I remarked how much satisfaction and success I had in the use of it in the saving of teeth; and to what an extent it was being used by many others in our profession. He replied that he could very easily understand why this was so, as he had always found, in exhuming the bones or skeletons of the ancient mound-builders, "that wherever the bones had lain either in direct contact with or even near deposits of copper, they were in a perfect state of preservation." This shows that the salts of copper do have a very decided preservative effect on bone-tissue.

Dr. Hamilton.—Here are some little books that I have made for records, in connection with the ordinary examination-cards. They are of the same size as the cards, and have a page for each tooth. I put down special memoranda, and find it extremely useful in referring to the previous condition of the tooth in cases of special treatment.

Dr. Banfield.—I hold in my hand two mandrils, that are the best I have ever used for holding sand-paper disks.

They are made by the Claflin Dental Manufacturing Company, of Worcester. They have two points of advantage,—first, the screw-head and its adjacent parts are made very thin, allowing

the disk to be carried far up between the teeth. Secondly, the screw-head is made so that only the circumference touches the disks, and by this means such a firm hold is obtained that there is no slipping when turned to the right.

WILLIAM H. POTTER, D.M.D.,
Editor American Academy of Dental Science.

Editorial.

PROFESSIONAL JEALOUSY.

IT is probably true that the human mind never will be free from petty envious feelings, yet it is equally certain that of all classes of the world's workers, professional men should rise superior to their disquieting influence.

If a profession is anything in its tendencies, it is humanitarian. If it fails in this it is dwarfed into a sordid effort for gain. The grosser elements of the human constitution, the legacy, it may be, of the savagism of the past, lead all in degree to entertain the selfish side and demand the largest portion of the loaf, whether that be in the form of knowledge or material benefit.

The fact that there are limitations to all effort seems to be lost sight of in the whirl of active life. Contentment with place is not generally one of the philosophies of mankind; the work of superior intellect is often marred by the unceasing sneers, the sharp retort, the coldness of mediocrity, the man of one talent aspiring to the place of the man with five, and the man with five ambitious for the place of the ten, and each tenacious of their prerogatives and jealous of their real or supposed rights.

It is in the memory of many now living, that there was a time in the history of dentistry when each practitioner was wholly isolated. To open an office for the admission of a fellow-dentist was an unheard-of condescension. To explain any process which might prove of value to a competing operator was an unthought-of extension of charity. Time made its changes in this, but how slowly it came, and through what struggles before visible progress was apparent. How many years before offices were freely opened, and how many more before men would present themselves at gatherings of their fraternity and tell all they knew? Yet the time

came, and from that period dentistry rose from its poor condition to one worthy of the respect of all classes. Societies have sprung into being everywhere. The man of isolation is no longer permitted. Hermits in professional life have ceased to be respected. The man who has something to say or something to show must say it or exhibit it. Each must take his part, for it is and must continue to be a busy hive without drones.

Having reached a stage of partial exemption from the evil, it is difficult for the practitioner of this country to comprehend that the old feeling still remains elsewhere, and is as much a source of bitterness in other lands as it was here during the first half of the present century.

It is the tendency of civilization to have periods of retrogression,—a time when, as it were, the one foot forward means the one step backward. It is to be feared that the attempt to build a professional wall around States, by laws which prevent the dentist recognized in one from settling in another, is in this direction, and in line with that which influenced the dentist who refused to permit a brother operator to cross his threshold.

It is not surprising that older civilizations have adopted this system of exclusion, for the avenues of labor are sharply defined in European communities, and it is often a matter of self-preservation to place a barrier to all outside intrusions.

A broader liberality exists with the dentists of this country, in spite of what we regard as but a temporary relapse. They appreciate the good in their own land, and are not ill-disposed to share it with less fortunate neighbors. No one here has reason to envy the older and better-grounded civilization of Great Britain, or the almost matchless scholarship of Germany. No one would debate the question with our English brethren as to the value of a solid collegiate training as a basis of professional study. No one can justly quarrel with the curricula of the dental schools or the higher standard of entrance examinations. A recognized dentist of England or Germany would not here be subjected to the surveillance of the police, at the request of fellow-practitioners, as has been done in the latter country. On the contrary, he would be received politely, and while he might be requested to comply with the law and pass the learned examination of some State Board, he would be accepted as one worthy high consideration.

Our thoughts have tended in this direction ever since the unseemly wrangle of words fully quoted from *The Journal of the British Dental Association* in our last number. The remarkable

statements in regard to colleges in the United States, and the perversion of facts in relation thereto, forces a return to the subject and to the spirit which evidently animated the writers.

The gravamen of this whole matter does not seem to have been to set us right in science and collegiate training, but rather to afford a basis for venting a spirit of jealousy of work other than their own. It is the same spirit that made the long contest between the Odontological Society of London and the College of Dentists of England one to be remembered. Jealousy and the spirit of caste served to place a barrier for years to the progress of the dental profession in that country.

The record made by the dentists of this land is one that requires no apology. Dentistry came here from the Mother-Country. It had but few caretakers in that early period, but it grew in strength and in time became a profession. It does not require a boastful spirit of expression to say that the world is indebted to the United States for dentistry as it stands to-day in civilization. About everything of practical value in appliances and treatment have originated here. Nor has this country been behind in the scientific work so much derided. It is unnecessary to give examples, but we are constrained to cite the fact that it was an American who solved the problem of dental caries, notwithstanding that the scientific minds of both England and Germany had been eagerly endeavoring to interpret the pathological phenomena connected with it for more than a century.

It is but just that these facts should be conceded, and that without reservation or fear of rivalry. The work of this land in this direction has been given freely, and as freely appropriated. It has been the aim to give credit to workers elsewhere, and we need only recall the Herbst testimonials in proof of it, yet it would show a want of the true scientific spirit, if the acknowledgment were not made that in some directions the practitioners of the Old World lead those of this country.

The environments of life on this continent make progress in certain directions more difficult for the professions than in older civilizations. The higher standard, easy of attainment in England must come slowly here; but it will come, and the superstructure will be built on a sure foundation of practical success.

The lines of separation which divide nationalities must be broken, and in the coming era those will be accorded recognition who can demonstrate that they have worked not for a narrow circle, but for the higher elevation of all races and of all conditions

A profession should know no bounds to fraternal progress, nor should the intellectual forces common to all nationalities be dwarfed by local prejudices or the conventionalities of race.

DR. C. M. RICHMOND'S PAPERS ON CROWN- AND BRIDGE-WORK.

IMPORTANT NOTICE.

We will begin in the July number of this journal the publication of a series of illustrated articles by Dr. Richmond. They will extend through the year, and probably beyond, and will appear in each number until completed. They will include his entire experience in the preparation of crown- and bridge-work, which, with the illustrations prepared directly under his supervision, must prove of exceptional value to all engaged in this work.

Dr. Richmond's recent introduction of a removable bridge of his own devising has received the highest encomiums from those most competent to judge, and we feel sure that this process must eventually commend itself to the profession generally.

It was the intention to have had this series of articles appear at an earlier date, but, in order that our readers and all interested should have the opportunity to secure them, it was decided to commence their publication in July. This will enable new subscribers to begin at the regular subscription period.

THE WORLD'S COLUMBIAN DENTAL CONGRESS.

We publish in the present number a full report of the decisions arrived at by the Executive Committee of this important meeting. Owing to an error in mailing, these failed to reach us in time for insertion in the May number.

The work of this committee has been of the most arduous character, involving unusual difficulties. That they have thus far given the preliminary arrangement most careful attention the report fully demonstrates. The list of names included in the committee's report embraces those of men prominent throughout the world, and involved very considerable labor in its preparation. There is much that is of importance yet to be done, and we anticipate from time to time to have the official announcements to lay before our readers.

While the committee are laboriously doing their share, it

would be well for those who propose to prepare papers to be at work. These, it is needless to add, should be of a truly scientific character. At such a meeting nothing but original thought should be permitted.

TO OUR CONTRIBUTORS.

We must urge again the rule of this journal, that all contributions or correspondence intended for the Editorial Department must be *sent direct to the Editor, No. 3243 Chestnut Street, Philadelphia.* Further, matter intended for publication in any given month, such as meeting notices, proceedings of societies, must be in his hands not later than the 5th.

Two rules should ever be present in the minds of writers,—first, to take the utmost care in the preparation of a paper; and, secondly, to write it so that it will give the least trouble to those who are obliged to arrange it for publication. The following suggestions may be of some value:

Write on one side of the sheet, beginning the first page half way down. Allow a margin of a half inch on the left side. Separate the lines, allowing space for the editor to make necessary corrections. Write in a round, clear hand, or have the paper type-written. Condense as much as possible.

Very few, we imagine, have any idea of the time wasted by editors, compositors, and proof-readers by the continued neglect of these simple but important hints.

CORRECTION.

In the editorial headed "English Criticism," in the May number, the name of the *British Journal of Dental Science* was substituted for *The Journal of the British Dental Association.* It is presumed the intelligent reader observed the error and made the proper correction.

Obituary.

DR. CHARLES A. KINGSBURY.

At the monthly meeting of the American Academy of Dental Science, held in Boston March 2, 1892, the following resolutions were adopted:

WHEREAS, Charles A. Kingsbury, M.D., D.D.S., late of Philadelphia, an associate member of the American Academy of Dental Science, has recently been called away from these earthly scenes into the higher existence beyond the grave, we, his fellow members, would offer the following resolutions of respect to his memory.

Resolved, That the Academy has received with sincere sorrow the intelligence of the decease of our highly-esteemed friend and associate.

Resolved, That, in the death of Dr. Kingsbury, the profession has lost one of its brightest and most honored members, and the city and community in which he lived one of its most exemplary and useful citizens. Dr. Kingsbury was engaged in active practice and Professor of Dental Histology and Operative Dentistry in the Philadelphia Dental College through a long series of years, and contributed much to elevate and adorn his profession. He lived to an advanced age, and had the pleasant satisfaction, in his declining years, of seeing the science and art of dentistry, and the standing of the profession, far advanced towards the ideal that he had formed for it in the thoughts and aspirations of his earlier years.

Resolved, That we tender our sympathy and condolence to his surviving family in their heavy bereavement and sorrow, and the Corresponding Secretary be requested to forward a copy of these resolutions to them, and that a copy be entered upon the records of the Academy, and published in the dental journals.

C. A. BRACKETT, D.M.D., *President.*
E. N. HARRIS, D.D.S., *Corresponding Secretary.*

Current News.

THE WORLD'S COLUMBIAN DENTAL CONGRESS.

[The following is taken from the full report of the proceedings of the General Executive Committee, prepared by Dr. A. O. Hunt, Secretary.—ED.]

CONSTITUTION, CODIFIED RULES, AND COMMITTEES AS ORGANIZED AND CONFIRMED TO DATE.

NAME.

Article I. The World's Columbian Dental Congress.

PLACE OF MEETING.

Article II. Chicago, Illinois.

TIME OF MEETING.

Article III. Monday, August 17, 1893, continuing until August 27, 1893.

OBJECTS.

Article IV. The bringing together for professional, scientific, and social purposes the dentists of the United States and all other countries.

OFFICERS.

Article V. The officers shall be a President, four Vice-Presidents, Secretary-General, and two Assistant Secretaries (to be selected with reference to linguistic attainments), and a Treasurer.

MEETING OF COMMITTEE.

Article VI. The General Executive Committee shall hold its meetings for the transaction of such business at such times and places as they may elect from time to time.

DUTY OF THE COMMITTEE.

Article VII. It shall be the duty of the Chairman of this committee to preside at all meetings of the committee, and to carry out any matters put in charge by the General Committee. He shall be considered an *ex-officio* member of all committees, and as chief executive officer of the General Executive Committee. He shall have power, upon consulting with three members of the committee, to call a meeting, when in his judgment it may be necessary.

DUTY OF THE SECRETARY.

Article VIII. The duties of the Secretary of this committee shall be to keep a record of all proceedings; to receive and put in proper form, for the use of this committee, a synopsis of the work accomplished, from time to time, by each of the special committees.

DUTY OF THE TREASURER.

Article IX. It shall be the duty of the Treasurer to receive and have in charge all money for or belonging to the "World's Columbian Dental Congress," and to pay out the same on the order of the Chairman and the Secretary of this committee, all bills having been passed upon by the Auditing Committee.

THE POWER OF THE COMMITTEE.

Article X. The General Committee shall have and exercise supreme control and direction in all matters pertaining to the organization and work in 1893.

QUORUM.

Article XI. Eight members will be required to constitute a quorum for business.

AMENDMENTS.

Article XII. These rules and regulations may be amended at any regular meeting of this committee, upon a vote of two-thirds of the members of the General Committee.

Special Committees.—1. A General Finance Committee, to consist of three members. 2. A Programme Committee, to consist of five members. 3. A Committee on Exhibits, to consist of three members. 4. A Committee on Transportation, to consist of three members. 5. A Committee on Reception, to consist of fifteen members. 6. A Committee on Registration, to consist of seven members. 7. A Committee on Printing Transactions, to consist of three members, of which the Secretary-General shall be Chairman. 8. A Committee on Conference with State and Local Societies, with a view of eliciting their interest and co-operation. 9. A Committee on the History of Dental Legislation in this and other countries. 10. Auditing Committee, to consist of three persons, of which the Chairman of the Finance Committee shall be one. 11. A Committee on Invitation, to consist of five members. 12. A Committee on Membership, to consist of five members. 13. A Committee on Educational and Literary Exhibit, to consist of five members. 14. A Committee on Clinics in Operative Dentistry and Oral Surgery, to consist of five members. 15. A Com-

mittee on Prosthetic Dentistry, to consist of five members. 16. A Local Committee of Arrangements, to consist of five members. 17. A Committee on Essays, to consist of five members. 18. A Committee on History of Dentistry in the United States, to consist of seven members. 19. A Committee on Nomenclature, to be filled at next meeting. 20. A Committee to promote the Appointment of Dental Surgeons in the Armies and Navies of the World, to consist of fifteen members. 21. A Committee on the Care of the Teeth of the Poor, to consist of five members. 22. A Committee on Biology and Bacteriology, to consist of nine members. 23. A Committee on Prize Essays, to consist of three members. 24. An Editorial Committee, to consist of five members.

Codified Rules.—The admission fee to the World's Columbian Dental Congress shall be fixed at ten dollars. To be collected only from residents of the United States.

Duties of Committee on Invitation.—The duties of the Committee on Invitation shall be to invite such scientific persons residing in the United States and foreign countries who are not members of the profession, but who, by their recognized attainments in special departments of science, would add interest to the meeting. They shall also furnish the Committee on Membership with a list of the names and residences of those invited.

Duties of Committee on Membership.—The duties of the Committee on Membership shall be to pass upon all applications for membership which may be referred to them by the Committee on Registration or the Treasurer.

Membership.—The membership shall consist of legally-qualified and reputable dentists (as defined in the Code of Ethics of the American and Southern Dental Association) residing in the United States, and all foreign dentists regularly qualified by the laws of the countries from which they come, and such other scientific persons as may be invited by the Committee on Invitation. Each and every member to be entitled to one copy of the transactions.

The Committee on Essays shall invite suitable persons to prepare papers for presentation to the meeting.

All papers to be read before the Congress shall be in the hands of the Committee on Printing Transactions at least six months before the date of meeting, and shall not exceed forty-five minutes in time of presentation. Said committee shall have full power to accept or reject any papers, to revise or suggest a revision by the authors, and to publish or not in the transactions the whole or parts of papers read, or abridgments thereof.

NOTE.—As the General Executive Committee did not define the duties of the several committees appointed, the Secretary deems it advisable to make the following suggestions in regard to the duties of committees not already defined, subject to the action of the Executive Committee at its next meeting:

No. 3. *Committee on Exhibits.*—It is expected that this committee will take charge of the different exhibits of the dealers and any other exhibits of a like character.

No. 4. *Committee on Transportation.*—The duty of this committee will be to look after the railroad and steamship lines, and obtain the best rates possible for the members of the Congress both in this and other countries.

No. 5. *Committee on Reception.*—It is expected that this committee will take charge of the comfort of all members of the Congress, and especially those members and strangers from foreign countries.

No. 6. *Committee on Registration.*—Duties of this committee will be to register all persons applying for membership in the Congress who are entitled to the same.

No. 9. *Committee on the History of Dental Legislation in this and other Countries.*—It is expected that this committee will collect the data relating to dental legislation in all the countries of the world from the beginning to the present time, and present a full report to the Congress.

No. 10. *Auditing Committee.*—Duties of this committee will be the auditing of all accounts and bills of the Congress preparatory for the signatures of the Chairman and Secretary of the General Executive Committee.

No. 13. *Committee on Educational and Literary Exhibits.*—It is desired to

have exhibits of a character that will show the results obtained by the various methods of dental education both in the past and up to the present time. Also an exhibit of the literary work of the profession to date.

No. 14. *Committee on Clinics in Operative Dentistry and Oral Surgery.*—It is expected that this committee will make every effort to secure operators to demonstrate any important or new methods of practice.

No. 15. *Committee on Prosthetic Dentistry.*—The duties of this committee will be of the same character as that of Committee No. 14, only the work will be confined to prosthetic dentistry.

No. 16. *Local Committee on Arrangements.*—Duties of this committee will be to make arrangements for the accommodation of the various committees and clinics and perform other duties of a like character, and to work in connection with the World's Congress Auxiliary.

No. 18. *Committee on the History of Dentistry in the United States.*—The appointment of this committee seemed necessary and important from the fact that in the work of Committee No. 8 there was collected a considerable amount of matter that should properly come under the management of a committee like No. 18. So it was deemed best to appoint a new committee to work with No. 8, and take charge of the special matter of the History of Dentistry in the United States.

No. 19. Not appointed.

No. 20. *Committee to promote the Appointment of Dental Surgeons in the Armies and Navies of the World.*—It is probably well known by the profession that for a number of years efforts have been made to appoint dental surgeons in the army of the United States,—so far without success; but it was deemed a matter of sufficient importance to appoint a committee to take charge of the matter, who might, by an organized effort, obtain at least the data that would have an influence upon any movement in this direction, should it be desirable to take action now or at some future time.

No. 21. *Committee on the Care of the Teeth of the Poor.*—It is common for the members of the medical profession in large cities, or in localities where it seems desirable, to devote a certain amount of their time in the interest of charity to relieve the diseases of the poor. It seems proper and right that the members of the dental profession should also do something in this way. The Executive Committee think that efforts should be made to suggest some practical plan to secure such services for the poor.

No. 22. *Committee on Biology and Bacteriology.*—Suggestions for the work of this committee hardly seem necessary while under the direction of its Chairman, whose experience and knowledge of results that can be obtained from work of this character are beyond question.

No. 23. *Committee on Prize Essays.*—It was decided by the Executive Committee of the Congress to offer a medal for the best paper on Dental Hygiene for public distribution. This committee was appointed to take charge of this matter, and its duties will be to decide upon the merits of the papers submitted, and to whom the medal shall be given.

No. 24. *Editorial Committee.*—The duty of this committee will be to prepare matter for public distribution and for publication in the dental journals.

The official languages of the Congress shall be English, French, Spanish, and German, and the papers shall be printed in the transactions in the language in which they are read.

After a paper has been accepted the committee shall prepare a brief synopsis to be published in the official languages of the Congress.

The Chairman of each committee shall send reports of progress to the Chairman and Secretary of the General Executive Committee at such frequent intervals as will keep them informed of all the work accomplished.

All public announcements for the General Executive Committee shall bear the signature of both the Chairman and Secretary.

All circulars issued by any committee must be sent to each member of the General Executive Committee, and they shall be of uniform size,—viz., that of the minute-forms issued by the Secretary.

Resolved, That this Dental Congress offer a medal for the best popular

paper on Dental Hygiene, for public distribution. To be referred to Committee No. 23, to be called a Committee on Prize Essays.

The following rules for the action of the Finance Committee were adopted:

Resolved, That the General Finance Committee be authorized to guarantee to contributors who would be eligible to membership as follows:

1. That every contributor of twenty dollars should receive the transactions of the Congress if he does not attend; and if he attends and joins the Congress, his receipt for contributions shall be accepted by the Treasurer as full payment of the membership fee of ten dollars.

2. That every contributor of thirty dollars or upwards shall have all the advantages of the contributor of twenty dollars, and, in addition, shall receive free the commemorative medal which will be struck.

3. That every contributor of ten dollars shall receive the transactions if he does not attend; but will be expected to pay the membership fee of ten dollars in addition should he attend the Congress.

4. That any funds which may remain in the treasury after the payment of all obligations will be donated to the Dental Protective Association of the United States.

The General Finance Committee was authorized to appoint a Sub-Finance Committee for each State and Territory.

Resolved, That all matters of business presented at the general sessions of the Congress shall be referred to the General Executive Committee, and must receive the endorsement of this committee before they can be entertained by the President of the Congress. Carried.

Resolved, Whereas, the management of the World's Congress Auxiliary of the Columbian Exposition, having offered suitable accommodations in the Art Building, on the lake-front in Chicago, for the sessions of the World's Columbian Dental Congress, August 17, 1893; therefore be it

Resolved, That the Executive Committee gratefully accept the same in the spirit in which it is offered. And be it further

Resolved, That the Secretary of the committee transmit to President Bonney a copy of these resolutions as an expression of their cordial appreciation of such generosity in our behalf.

At the request of President Bonney, a committee of conference for the World's Congress Auxiliary was appointed.

Resolved, Whereas, all other convocations to be held in Chicago in 1893 in connection with the World's Columbian Auxiliary are called Congresses; therefore be it

Resolved, That the word "Meeting" be stricken out and the word "Congress" inserted in Articles 1 and 9 of the Constitution, and wherever it occurs in the proceedings to date, with the distinct understanding that this Congress shall not be considered as having connection with any preceding or future Dental Congress, but be a unique, complete, and final meeting. Unanimously adopted.

COMMITTEES AS APPOINTED AND CONFIRMED TO DATE.

General Executive Committee.—Dr. W. W. Walker, Chairman, No. 67 West Ninth Street, New York City; Dr. A. O. Hunt, Secretary, Iowa City, Ia.; Dr. John S. Marshall, Treasurer, No. 9 Jackson Street, Chicago, Ill.; Dr. W. . Barton, Paris, Texas; Dr. L. D. Carpenter, Atlanta, Ga.; Dr. J. Y. Crawford, Nashville, Tenn.; Dr. M. W. Foster, No. 9 Franklin Street, Baltimore, Md.; Dr. A. W. Harlan, No. 70 Dearborn Street, Chicago, Ill.; Dr. H. J. McKellops, No. 2630 Washington Avenue, St. Louis, Mo.; Dr. G. W. McElvaney, Columbus, Ga.; Dr. H. B. Noble, New York Avenue, Washington, D. C.; Dr. John C. Storey, Dallas, Texas; Dr. C. S. Stockton, Newark, N. J.; Dr. L. D. Shepard, No. 330 Dartmouth Street, Boston, Mass.; Dr. J. Taft, Seventh Street, Cincinnati, Ohio.

Committee of Conference for World's Congress Auxiliary.—W. D. Miller, . Busch, Berlin, Germany; Thomas W. Evans, E. Magitot, E. Lecaudy, Paris, France; G. W. Sparrock, Lima, Peru; W. B. Macleod, Edinburgh, Scotland; . W. W. Baker, Dublin, Ireland; Ernest Sjoberg, Stockholm, Sweden;

Charles S. Tomes, W. H. Coffin, London, England; W. George Beers, Montreal, Canada; H. C. Edwards, Madrid, Spain; L. D. Shepard, Boston; J. G. VanMarter, Rome, Italy; Plattschick, Pavia, Italy; Joseph Arkövy, Buda-Pesth, Hungary; C. Redard, Geneva, Switzerland; W. H. Morgan, J. Y. Crawford, Nashville, Tenn.; W. H. Dwinelle, Benjamin Lord, A. L. Northrop, W. W. Walker, New York City; R. B. Winder, F. J. S. Gorgas, M. W. Foster, Baltimore, Md.; Elisha G. Tucker, Boston, Mass.; W. W. H. Thackston, Farmville, Va.; J. B. Rich, R. Finlay Hunt, H. B. Noble, Washington, D.C.; J. D. White, J. E. Garretson,[1] Philadelphia, Pa.; W. H. Eames, H. J. McKellops, St. Louis, Mo.; J. B. Patrick, Charleston, S. C.; C. C. Knowles,[1] San Francisco, Cal.; G. V. Black, Jacksonville, Ill.; E. Bacon, Portland, Me.; W. W. Allport, A. W. Harlan, J. S. Marshall, Chicago, Ill.; W. J. Barton, Paris, Texas; J. Taft, Cincinnati, O.; C. S. Stockton, Newark, N. J.; A. O. Hunt, Iowa City, Ia.; George W. McElhaney, Columbus, Ga.; J. C. Storey, Dallas, Texas; L. D. Carpenter, Atlanta, Ga.

No 1. *General Finance Committee.*—L. D. Shepard, Chairman, No. 330 Dartmouth Street, Boston, Mass.; T. W. Brophy, No. 96 State Street, Chicago, Ill.; A. L. Northrop, New York City.

No. 2. *Programme Committee.*—Not appointed.

No. 3. *Committee on Exhibits.*—Charles Pruyn, Chairman, No. 70 Dearborn Street, Chicago, Ill.; Arthur E. Matteson, No. 3700 Cottage Grove Avenue, Chicago, Ill.; E. M. S. Fernandez, No. 103 State Street, Chicago, Ill.

No. 4. *Committee on Transportation.*—F. H. Gardiner, Chairman, No. 126 State Street, Chicago; V. H. Jackson, No. 240 Lenox Avenue, New York City; George Eubank, Birmingham, Ala.

No. 5. *Committee on Reception.*—W. W. Allport, Chairman, No. 9 Jackson Street, Chicago; W. W. H. Thackston, Farmville, Va.; G. H. Bently,[1] No. 70 Dearborn Street, Chicago; E. M. S. Fernandez, No. 103 State Street, Chicago; George A. Christmann, *Staats Zeitung* Building, Chicago; James McManus, No. 32 Pratt Street, Hartford, Conn.; Elisha G. Tucker, Boston, Mass.; John D. Thomas, No. 912 Walnut Street, Philadelphia; H. J. McKellops, No. 2630 Washington Avenue, St. Louis; L. L. Dunbar, No. 500 Sutter Street, San Francisco, Cal.; V. E. Turner, Raleigh, N. C.; Joseph Bauer, No. 130 Esplanade Street, New Orleans, La.; J. F. P. Hudson, No. 19 West Thirty-ninth Street, New York City; W. P. Dickinson, No. 608½ Nicollett Avenue, Minneapolis, Minn.; C. F. W. Holbrook, No. 34 Park Street, Newark, N. J.; W. J. Foster, No. 9 West Franklin Street, Baltimore, Md.; R. M. Sanger, East Orange, N. J.

No. 6. *Committee on Registration.*—Fred A. Levy, Chairman, No. 343 Main Street, Orange, N. J.; E. L. Clifford, No. 401 West Monroe Street, Chicago, Ill.; George N. West, No. 34 Monroe Street, Chicago, Ill.; J. Y. Crawford, Nashville, Tenn.; C. V. Rosser, Atlanta, Ga.; T. L. James, Fairfield, Ia.; W. H. Fundenberg, No. 323 Pennsylvania Avenue, Pittsburg.

No. 7. *Committee on Printing Transactions.*—Not appointed.

No. 8. *Committee on Conference with State and Local Societies.*—J. Taft, Chairman, Cincinnati, O.

LIST OF STATE COMMITTEES.

Alabama.—E. S. Chisholm, Chairman, Tuscaloosa; A. Eubank, Birmingham; Charles P. Robinson, Mobile; G. M. Rousseau, Montgomery.

Arizona.—L. N. Goodrich, Chairman, Phœnix; D. Pentland, Prescott; J. Hardy, Phœnix; W. Warnekross, Tombstone.

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PENNSYLVANIA AND NEW JERSEY STATE DENTAL SOCIETIES' JOINT UNION MEETING.

TO BE HELD AT CRESSON SPRINGS, PA., JULY 19, 20, 21, 1892.

THE attention of the profession is called to the formation for this meeting of a Clinical Conference, composed of well-known practitioners, to be divided into three sections, for the presentation by dentists in actual practice for advice. Section 1. Oral Surgery,—viz., treatment of pyorrhœa alveolaris, congenital deformities, oral irregularities, etc. Section 2. Mechanical dentistry,—crown- and bridge-work, gold and porcelain crowns, metal and plastic bases,

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[1] Declined.

etc. Section 3. Operative dentistry,—all cases in general practice. Dentists are requested to communicate at an early date with the undersigned chairmen of the State Committees.

Dr. W. E. Magill, Erie, Pa.
Dr. H. A. Hull, New Brunswick, N. J.

AMERICAN DENTAL SOCIETY OF EUROPE.

The American Dental Society of Europe will hold its eighteenth meeting at Basel, Switzerland, August 1, 2, and 3. Members of the profession are cordially invited to attend. Clinics will be a special feature of this meeting. The University will place desirable rooms at the disposal of the Society, and an ingenious amphitheatre for accommodating in the immediate vicinity of the patient a larger number of spectators than are able to witness operations under ordinary circumstances will be loaned by the Swiss Dental Association. Programmes may be had on application to the President, Dr. Bryan, of Basel, or to

Chas. W. Jenkins,
Secretary.

THE MISSOURI STATE DENTAL ASSOCIATION.

The Twenty-eighth Annual Meeting of this Association will be held at Clinton, Missouri, commencing Tuesday, July 5, and continuing four days. Members of the profession are cordially invited to be present.

William Conrad,
Corresponding Secretary.

St. Louis, Missouri.

MASSACHUSETTS DENTAL SOCIETY.

The Twenty-seventh Annual Meeting of the Massachusetts Dental Society will be held in Boston, July 7 and 8, 1892. It is intended to make this meeting of unusual interest. The annual address is to be delivered by Dr. L. D. Shepard, of Boston. Other prominent men are expected to participate in the meeting. All members of the profession are invited to attend.

Edgar O. Kinsman,
Secretary.

Cambridge, Mass.

THE

International Dental Journal.

VOL. XIII. JULY, 1892. No. 7.

Original Communications.[1]

CROWN- AND BRIDGE-WORK.[2]

BY DR. C. M. RICHMOND, NEW YORK.

[The present article is preliminary to a series of papers in which it is proposed to explain the various processes adopted to facilitate the preparation of this form of denture. The text will be fully illustrated to enable the reader, by careful comparison, to follow the instructions given.—ED.]

AN incident related at the late mass meeting in the interest of the Dental Protective Association is very appropriate here. An ardent practitioner, living in the distant part of New York State nine years ago, wrote to another in New York City inquiring what was thought of this new fad of crown- and bridge-work, which seemed to be exciting the ambitions of those who were determined to force themselves into the front rank on their merit. The answer came emphatically that no dentist of reputation was having anything to do with it. *Palma non sine pulvere.*

Evolution has played a successful part in this as in all things that have the germ of progress in them. I need not tell any intelligent, observing dentist that this branch of dental practice is now regarded as of immense importance. It has been of untold blessing to many, and will continue to be in the hands of competent

[1] The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

[2] Copyright, 1892, by Dr. C. M. Richmond.

practitioners. Many things have occurred on which to found a supposed basis of criticism, or more of fault-finding; and much wholesale condemnation has been indulged in, in which the principles upon which the work rests have been wholly disregarded. A vast amount of material has been given out that has been of an experimental nature, and, not infrequently, enthusiasm has gotten the better of good judgment, and hence many failures have marred the easy progress that would have occurred if a little slower pace had been made. Practical cases, worn for many months or years, carry a potent conviction to the minds of practical men, and commend the efficiency of such work. A detail of many such cases proves, by the clinical illustrations exhibited, that in each operation is indicated its own necessities and the mother of invention comes to the rescue and each one results in a lasting benefit and success to the patient and a compliment to the operator. "Proving all things, and holding fast that which is good" is verified in this method of teaching and must be so full of suggestion to one of limited experience as to study them with a diligence worthy of ultimate special ability in this branch of work. Only such as are eager to become able and have real mechanical talent can assure themselves that they have a mission in such a field of labor.

In this, my first article on crown- and bridge-work, I have taken an extreme case to show that portable bridge-work can be made a success if the work is well done. This case is an upper set of teeth held by two wisdom-teeth, and after seven years of continual use it shows no signs of failure.

The case was sent to me by Dr. LeRoy Satterlee, of the New York Dental College, and as he knew nothing of the conditions existing, had told the lady that she could have the case made without a plate. When the patient came to my chair she took from her mouth an upper set of teeth made on a rubber plate. I looked at her in surprise, and told her, as she had lost all of her upper teeth nothing could be done for her. She looked up and said, "I have two new teeth," and with my glass I found the wisdom teeth erupting, and they had moved the plate until it had lost its suction. The patient, observing a doubt in my expression, looked up and said "My heart is fixed on having a set of teeth put in without a plate so don't say it can't be done."

An impression was taken and the patient sent home, and was told to come in at another time; this request being made to get time to think the case over.

After the patient had gone, a model was cast of fusible meta

Fig. 1.

Fig. 4.



Fig. 4.

Fig. 5.

Fig. 2.



Fig. 2.

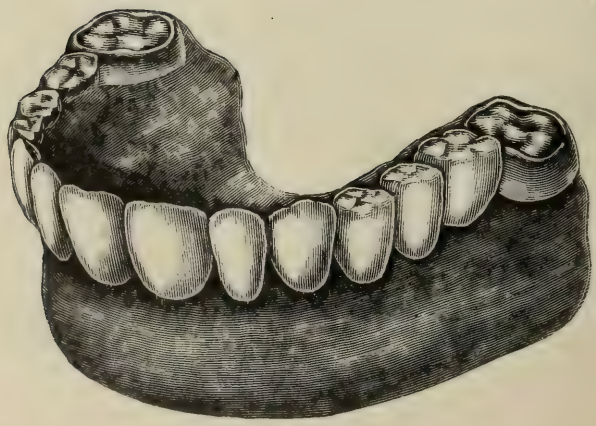
Fig. 6.

Fig. 3.



Fig. 3.

Fig. 7.



or the case (shown in Fig. 1). Then the model was cut away with burr to get more room to work at the gum line of the two teeth. fitted two gold bands around them as best I could. When the atient came in again she was told of the chances of failure and of he poor chances for success; but she said, "Do the best you can." then fitted the two bands to the teeth so closely that when the ower edges of the bands passed the largest place in the circumfer- nce of the teeth they fitted so tightly that they required the force f a pair of flat-nosed pliers to remove them. The bands were hen cut the right length to open the mouth to a proper distance vhen they came in occlusion with the lower teeth. Swaged cusps vere now soldered on to the bands. I had now two gold crowns vhich gave me my guide to work by, and afterwards I fastened hem in place with cement.

The next step was to fit these two crowns with what I term elescopic fitting bands of clasp metal, No. 28 thick (United States tandard). A plaster impression was then taken of the crowns nd cast dies of fusible metal, as shown in Figs. 2 and 2, and there vas now a fac-simile of each crown in a *hard* metal, which would ndure all the hammering that might be required to perfectly fit he clasp bands to them, as shown in Figs. 3 and 3. In making hese bands, I bent the clasp metal carefully to fit the dies, Figs. 2 nd 2, as well as it could be done with clasp benders and pliers; hen afterwards soldering them.

Now, with a copper hammer (which does not mar the surface of, he gold), the bands were driven on to the dies a little at a time, orcing the bands into place until they were perfectly fitted, as hown in Figs. 3 and 3.

An impression was now taken of the case in plaster, and I cast nto it another fusible metal die so the two bands could be placed in osition on the model, as shown in Fig. 4, which being done they ere now ready for the "bite," which is taken in the ordinary way n wax.

The case was now ready for the teeth. After selecting a set hich could be put into the case without the least grinding, I icked them up with pure gold and invested them, using half mar- e-dust and half plaster. Each tooth was then placed in its own vestment, and they were put into the fire and heated up to the roper point for soldering. I then covered each one with solder, that there was enough gold to make the bridge strong when the eth were all put together in one piece. After the teeth came out the fire they were ready to be waxed into place in the articula-

tor, which now had the metal die with the bands in position, al the "bite" of the lower teeth. The teeth were then waxed in tw pieces from the bands to "the centrals,"and invested again in tw pieces, and when they had been cleaned free from the wax (whic is done with boiling water) they were placed in the fire and sc dered, each of the teeth together, and as they had been backed u before, it only required a small piece of solder to join each toot This was made in two pieces to avoid any shrinking of the par after the *last* soldering, as it is only soldered in one place finally ar the change is not perceptible, but if it is soldered all at once th case would not go on, as the contraction would bring the bands o of the circle towards the centre one-eighth of an inch or more. was now ready to put the parts together, as in Fig. 5. As the cent of this bridge must be supported, I placed a small saddle, the size half of a five-cent piece or the width of the centrals, on the gun in the centre of the case, as shown in Fig. 6. This is made b taking a piece of pure gold, thirty thick, of the right size an shape, and by burnishing it on to the centre of the model in th right position, a perfect-fitting saddle is secured. This was place in the proper position on the cast, which was held in the articulato and the two pieces, being soldered, were ready to slip on the di Fig. 7, and the saddle was secured into position by wax, and th two halves were now held together by the same material, and th whole brought to form by wax, so it presents the same view as does finished in Fig. 7. This was now strong enough to try in th mouth waxed together in the centre. If the case goes to its plac and the saddle is in its proper position, I take a plaster impressio over the teeth to use as a trial matrix, as it is impossible to tal the case off from the model, Fig. 5, or from the crowns in th mouth, without, in a slight degree, displacing the parts where is waxed in the centre, and as the plaster impression is very pe fect it can be used to try the case just before the last investmen Teeth were used in this case not gold tipped, as in *fixed* bridges, f the reason that if a tooth is broken, it can be at once repaired, ar also because the artistic effect is perfect. Only one tooth has be broken in this case in the seven years it has been used.

I am in favor of *movable bridge*-work in *all* cases, as they c be easily and cheaply repaired. Drs. S. G. Perry, A. L. Nort rop, and W. W. Walker have examined this case, and they c verify my assertion that it is as perfect as to mechanical and pat ological conditions as if it were finished only yesterday.

The fusible metal used is as hard as zinc, and herewith I gi

the formula (metals to be melted together in the order named). This compound can be melted and poured into a plaster impression without generating steam, as it melts at 150° F.

Tin	20 parts by weight.
Lead	19 " " "
Cadmium	13 " " "
Bismuth	48 " " "

(To be continued.)

THE FACTORS CONCERNED IN DENTAL DETERIORATION.[1]

BY L. C. F. HUGO, D.D.S., WASHINGTON, D. C.

Our patients often ask us why it is that human teeth are so bad and so much worse than those of older generations.

With a view to being prepared with an answer, in accordance with our present light, I have consulted on this subject the best thought of our profession. In this paper I present to you a *résumé* of that inquiry, together with some comments and elaboration of my own.

Though limited to two or three generations, the layman's observation of the progressive decadence of civilized man's dental organs is in harmony with the dentist's extended knowledge covering thousands of years.

According to Dr. Darby, of Philadelphia, the teeth of the ancient monks in the charnel-house on Mount Sinai show that the farther back they date the more nearly free from decay they are. He examined a large number of Egyptian mummies, finding ample jaw and but little defective dental structure. The remains found in the *huacas* or tombs of Peru show the teeth in almost perfect condition, as is likewise the case with those in the crypt at Hythe, England. The Druids of Anglesea, as attested by their teeth, were seldom subject to dental troubles.

In disagreement with the examples of ancient teeth just given are the Etrurian remains, which show extensive dental lesions. To my mind the condition of these teeth does not antagonize, but is rather a confirmation of, the opinion that among civilized nations

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[1] Read on the twenty-fifth anniversary, November 23, 1891, of the Washington City Dental Society.

there is progressive dental deterioration. Let us see. Hundreds of years before the founding of Rome, Etruria was a *civilized* country. Commerce was the principal pursuit of its inhabitants. A luxurious life was the goal of their existence. Furthermore, the teeth, having been found in tumuli, are in all probability the remains of a class of persons in whom ease, luxury, vice, capricious appetites had wrought the same results as are now observed under similar circumstances among us. The Etrurian examples are only apparently exceptional.

Now as to modern teeth. Dr. Beers, of Montreal, says, "It is probably a perfectly safe estimate to make that in American and Canadian cities of fifty thousand people not a hundred native-born can be found, between the ages of four and fourteen, who have wholly escaped caries and premature loss of some of the teeth. If the ravages were to proceed in the same ratio, men and women would be edentulous by the time they were forty, were it not for the preservative skill of the dental operator." Dr. Ottofy, of Chicago, examined the teeth of children in public schools. Of six hundred and twenty-three pupils between the ages of five and fifteen, only forty-eight had perfectly sound teeth,—that is, only seven and one-half per cent.

Dr. B. W. Richardson, an English observer, "found that, of over four thousand persons of both sexes and of all ages, over eighty, per cent. were affected more or less severely with dental caries, while it was rare to meet with a person in whom both sets of teeth were altogether free from disease."

Though this is the extreme of widespread dental defectiveness, it may serve as an illustration of what is found among modern civilized nations, and among semi-civilized or barbarian people that come in prolonged contact with civilization.

Not only has there become observable in the teeth a gradual structural change, but an anatomical one as well. It has been noted that frequently the upper wisdom-teeth of civilized nations have only two roots,—and these often coalesced,—whereas the *dens sapientiæ*, as seen in the most ancient jaws exhumed in Europe, shows uniformly three distinct roots. Nature does not stop here, but, in accordance with "the law of economy of growth," she is stamping condemnation upon the tooth under consideration, by permitting it to be of readily decayable structure, or by suppressing it altogether. The upper lateral, too, is occasionally missing. These two classes of teeth are the least useful in the set, and in a crowded jaw they may well be dispensed with to give their better

neighbors more room. The question presents itself—*Quousque tandem?*—will this process of elimination end here?

Let us now examine the factors concerned in bringing about man's dental impairment.

For convenience of consideration these factors may be grouped as *remote*,—those affecting the teeth through the general system, whether directly or indirectly,—and *immediate*,—those directly affecting the external local condition of the teeth.

The *remote factors* are,—

1. Civilization in some of its *effects or concomitants.*
2. Change of diet involving a lack of functional exercise of the teeth.
3. Impairment of the general health.
4. Prenatal influences.
5. Crossing.

CIVILIZATION IN SOME OF ITS EFFECTS OR CONCOMITANTS.

It is an indisputable fact that certain features of civilized life tend to the decadence of physical vigor. The principal element in this condition, however, is the check offered by civilization to the weeding-out process of "the survival of the fittest." The healing art and improved sanitary observance have kept and are keeping alive persons that in uncivilized life would have died before reaching maturity. It is the offspring of this class of persons that furnishes so large a percentage of the sum total of physical degeneracy. "For all France the mortality in 1771 was 34" (in 1000); "by the year 1801 it had dropped to 28; in 1883 to 22." This shows an immense gain in the preservation of life,—the weak deriving the larger share of the gain.

Though civilization has done this much to preserve and propagate the physically degenerate, and though it has decidedly enervating influences, we must not—and this mistake is often made—*blame civilization per se.* It is not necessarily incompatible with sound physical development. Some of the most highly civilized people, such, for example, as members of the upper class of European society living in the country, have a strong, sound physique, with good teeth, much better usually than their countrymen of a lower social scale. But these persons are exceptional, because they lead conservative lives; because they live near nature; because they follow Cleobulus's advice, "Avoid excess;" because they take advantage of the *beneficial* features of civilization, and by intelligent discrimination escape the deleterious.

Comparing the nerves, muscles, and bones of the present civilized with those of uncivilized man,—ancient or modern,—we cannot help thinking that, in some degree, the ameliorations of civilized life impose physical degeneracy. By the word ameliorations, as here employed, is meant in a broad sense the supplantation of brawn by brain, bodily exertion by labor-saving machinery, exposure by protection.

Primitive man, with his steady nerves, tough muscles, and strong bones, was by the stimulus of his environment and by the weeding out of the weak, prepared to hold his own under the trying conditions of the struggle for existence. This resulted in the production and preservation of physical soundness.

Man, however, is said to be naturally lazy. His brain from the awakening impulse studied the "royal road" to ease,—that is, he began ameliorating his condition. In course of time, as his intellect developed, his experience increased, his observations expanded, he began to subjugate the animal world and the crude forces of nature, to serve as more convenient and improved means to his ends. In other words, the cunning of his brain devised means to lighten the burden of his muscle. It sought to secure him safety from the wild beasts and from the inclemencies of weather; it sought to widen the range of his food articles, to save an expenditure of effort in making these articles more easily obtainable and less difficult to chew. In short, he began growing away from the very conditions that had developed him into physical perfection, to become that artificial product,—that paradoxical miscellany of virtue and vice, of strength and weakness, *modern civilized man.*

In a great measure he has made himself; hence he lives without due regard to many of the requirements of his animal economy. Quite true, tolerant nature will adapt herself to circumstances. But when man outruns his rate of adaptation, he must suffer impairment of health.

Dental defectiveness was the exception not only in ancient man, where he lived, as Aurelius advises, "according to nature," but it is the exception even now in uncivilized man, where he still lives in barbarian purity. An examination of his mouth, or of the skull of his immediate ancestor, will give abundant proof of what has just been stated. The Earthmen, living in the Kalihan Desert, South Africa, are, it is said, "complete savages, and yet have ideally perfect teeth." John R. Mummery has examined about three thousand skulls of modern barbarians, finding but little decay and few irregularities. Dr. Winder found in one thousand skulls, principally of

Indians, only about fifty defective teeth. The few Eskimo and even the Sandwich Islander remains made a good showing.

Observation goes to prove that the more nearly pure his type and the nearer to original conditions man lives the better his teeth are. But, let him come in contact with certain ways of civilization, and he will in a few generations bear the indubitable physical record of it. In speaking of the Indians in their habitat, an ethnological observer says, "The vices of civilization have not tainted their blood, nor its luxuries sapped their strength." But removed from their natural home and surroundings, they lose their bodily vigor. The Indian boys put to school at Chemawa are soon transformed into the ordinary cage of human ills, among which "the hell o' a' disease" is not the least annoying. But a comparatively short time ago the teeth of the Sandwich Islander were good. Now, having tasted some of the fruits of civilized life, having contracted new habits and diseases, his teeth are deteriorating. Dr. H. Flagg says of the Matto-Grosso Indian, that in his home, where he is at liberty to secure what he likes, he dies with his teeth in. "Take now the same Indian and subject him to what we call civilization. He may be badly nourished, because he is overworked and underfed, or he may be badly nourished because he is overfed and underworked;" at any rate his teeth suffer. The Southern negro, prior to a quarter of a century ago, when he lived on simple, coarse food, worked regularly, and took proper rest, possessed good teeth; but now, as he gets access to a greater variety of food-articles, prepared so as to require little or no hard chewing, works less, and is more irregular in his habits, in short, enjoys some phases, not always of the best, of civilized life, is beginning to show, by a progressive though slow deterioration of his teeth, the effect of his ameliorated condition. Poor "Lo!" as he becomes civilized, eats pie, and drinks fire-water, evinces in the poorer structure of his dental organs the unmistakable signs of a changed life. In all this we can see a distinct relation between the physical condition of man and the degree of his removal from natural environment. I am, of course, speaking in terms of grand averages.

CHANGE OF DIET INVOLVING A LACK OF FUNCTIONAL EXERCISE OF THE TEETH.

The teeth grew in man's jaw to meet certain requirements of his diet; and they performed their office just as the teeth of the lower animals of to-day, living in a natural condition, still do their whole duty.

Just here the question may be asked, Why is it that dental decay is by no means infrequent among our four-footed friends, and yet they live on practically the same food as their habitat would yield them. It may be worth while to examine this point. Thus far dental lesions have been observed in such *domesticated* animals as horses and cows. In these occasional cases, may not the animals have been treated in violation of the laws governing their natural food-seeking and food-chewing? May they not have been kept in small, ill-ventilated places? May they not have been neglected as to sufficient feeding and watering? May they not have been obliged to subsist on food that in their habitat they would refuse to eat? Very likely, if we investigate their history, we would find that man's interference will account for these lesions in the lower animals as well as for those in his own case. Where dental decay in the lower animals is not due to man's agency, we may look upon it as a *lusus naturæ.*

Civilized man's extended range of food-articles and his improved methods in making them easily masticable result in a partial disuse of the chewing-apparatus.

While a radical change of diet may only affect the condition of the teeth, it is sometimes followed by surprising anatomical alterations. For example, we are told John Hunter fed a gull on grain. The change from a fish diet resulted in the development of a gizzard, which up till then had been in a rudimentary state. This seems to show that the gull of to-day lives on different food from that of his ancestors. Professor Peirce says of a certain species of ant-eater that in the anterior part of this animal's jaw there are no teeth, except occasionally an aborted lateral. Yet the *germs* of the front teeth are always present in the jaw. He infers that, in the distant past, the ancestors of the ant-eater must have lived on food requiring front teeth; and that a change of diet resulted in this suppression.

It is well known what can be accomplished by specially-directed training. How endurance may be increased, how muscles may be strengthened, how lung-capacity may be enlarged, how even the general frame may be further developed. Even sight, hearing, touch are susceptible of improvement.

If, then, by proper exercise capacity can be raised above the individual normal, may it not by lack of due exercise be brought below that normal, and in time to positive degeneration?

We have all experienced that when, for some reason, chewing must for a while be done on one side of the mouth, the other will feel weak and lame. Now, if exercise be curtailed on both sides, we

can readily see how a slight weakening may take place. Multiply this by generations, and an appreciable result will be had. This may serve as an illustration of deteriorated function.

I have repeatedly noticed that the teeth of one jaw opposite to spaces left by extraction in the other were badly decayed, while the teeth in the immediate neighborhood which had opponents were perfectly good. This illustrates deterioration of organ from disuse.

To make generalized statement of the above we may say,—

If exercise of function is divorced from organ, the tendency will be towards deterioration of function, and reflexively deterioration of organ. Hence it may be laid down as a law that it is the degree of functional exercise that determines the state of health, working capacity, and structural condition of the organ.

It will be found that where a people is of pure type, does not intermarry too closely, lives on plain food, which to be comminuted requires a positive effort on the part of the oral mill, the teeth will be of good quality. The Scotchman exercises his chewing-apparatus on coarse, hard food; in some parts of Germany the well-known pumpernickel (black bread) thoroughly tests the efficiency of the native grinders; the South Russian, between meals, chews the hard seed of the Turkish sunflower; the North Siberian eats a coarse black bread, and after meals chews spruce-rosin; the Egyptian and the Arab live on coarse barley bread with almost no meat; our Indian has a meat diet with but little bread, which, however, is coarse; the Terra del Fuegian has large, strong teeth which perform their whole duty on very hard food. All these peoples, where they lead a simple life, comparatively free from strong drink and hereditary encumbrance, have but little, if any, use for the dentist. Those in civilization have, of course, greater need of his services. Where, for example, rice is the "staff," supplemented by other soft food, as among Oriental nations, socket-catarrh and decay of the teeth are more frequent.

Of all peoples, we Americans are *said* to have the greatest need of the ministrations of dentistry. With us are to be found almost all the elements concerned in bringing about dental deterioration. By descent we are a great mixture. Our life is a constant nerve-strain. As James Stirling says, "The deepest-rooted cause of American disease is that overworking of the brain and over-excitement of the nervous system, which are the necessary consequences of their intense activity." Our city population soon reaches the condition of Rufus Choate, who, being warned that he would by his overwork soon break down his constitution, replied, "Good

heavens, my dear fellow! my *constitution* was all gone years ago, and I'm living on the by-laws." Our food is multifarious and of soft preparation. Even if it were simple and hard, we would be too much pressed for time to chew it. Hence our teeth have a "plentiful lack" of functional exercise. It is no argument to hold up to us the Eskimo, as has been done, and say, Here is a man that lives on blubber, which does *not* tax the dental organs, and yet he has no dental bills to pay. In the first place, this interesting individual's diet extends beyond blubber. He lives on reindeer, geese, seal, walrus, etc. His teeth crack many a small bone. Furthermore, the Eskimo's forefathers from the "time whereof the memory of man runneth not to the contrary," lived on the same food and used their teeth in the same way as their successors now do. And so long as the latter continues to live in barbarian purity, however filthy that may be, so long will they dispense with the services of dentistry.

With us the case is different. Our forefathers lived nearer to nature than we do. One of the conditions that preserved their chewing-apparatus was vigorous exercise on food necessitating it. This condition has become ameliorated.

For generations it has been the profitable study of the miller to produce a finely-ground flour; for generations it has been the remunerative object of the baker to make of this flour a soft, light bread; for generations it has been the ambitious desire of the cook to produce soft preparations of meat and vegetables. This being the case indifferent teeth are sufficient for present requirements.

Do not misunderstand me as to the miller. He is usually misrepresented. He does not materially rob the flour of its nutriment. Investigation proves that in removing the cortical layers of the grain only a slightly nutritious element is lost. The central four-fifths of the grain contains almost all the desirable elements, namely, gluten, starch, etc. The harm done is this, that, in the refining process, our masticating-apparatus is cheated of its work; and, incidentally, that a good stimulus to peristalsis is lost.

Stephen Girard is quoted as saying that teeth are like boys,—when they had nothing to do they fell into bad habits. To keep his dental boys out of mischief he amused them with "hard tack." I have no doubt that our forefathers were fond of chewing the articular ends of small bones. To this day we occasionally meet persons indulging themselves in this direction; and many more would do so if they were not afraid of breaking their teeth. We cannot deny that the exercise would be beneficial.

A dentist, to illustrate the value of using the grinders on hard food, relates the following: "In a family of five children, whose parents . . . had good teeth, the three eldest, whose diet required something more than the average of mastication, have good and dense teeth. The mother, having great faith in bread and milk, insisted on getting a cow, and for twelve years from their infancy the two youngest children lived mainly on bread broken into milk. The result was in the main good health for the two boys, but lamentably inferior and sensitive teeth." The experiment was ended by putting the boys on hard fare, when a great improvement was noted.

Other things equal, tobacco-chewers have better teeth than non-chewers. Why? Not on account of any known virtue in the weed, but because of the exercise involved. Chewing gum, if we stop to reflect, is not so reprehensible a practice. In fact, the young lady may justify her indulgence by claiming that the muscular effort expended is in the line of economic conservation.

IMPAIRMENT OF THE GENERAL HEALTH.

That there is an interdependent relation between the whole animal body and its parts is an easily-observed fact. Every day the dentist has cases in which he can see how the general health affects the teeth. One way in which they plainly show their sympathy with the lowering of the systemic tone is in the lessened power of resistance they offer to the changed, vitiated condition of the fluids in the mouth and stomach. Catarrhal throat and nervous dyspepsia, for example, make sad havoc in many mouths.

The teeth, being of a structure that has not the power of restoration possessed by the soft tissues, will often bear permanently a record of profound systemic disturbance. Eruptive diseases, such as scarlet fever, small-pox, even measles and enteric affections, will sometimes leave their indelible inscriptions.

In the adult, nerve-wear, brain-strain, will at times so reduce the resistive power of the teeth that the dentist's restorative efforts become despairingly inefficient. Dr. Fothergill says in this connection, "The dental caries so prevalent, indeed universal at the present day, is but a part of the general widespread failure of the digestive organs. . . . Whence comes the profound modification of the organic processes, the commissariat of the active or animal part of the body? It is the effect of modern life upon the nervous system." Dr. J. L. Williams has observed degeneration of dental tissues as "a result of long-continued, intense mental activity."

Gout and rheumatism, with their particular effect upon the alveolo dental membrane, tubercular, syphilitic, scrofulous taints, morphine habit, in short any affection or practice reducing neural energy which is followed by a disturbance of the nutritive repair, will have its due deleterious effect upon the dental organs. When we consider that in addition to its special troubles, our chewing-apparatus is under the implacable tyranny of hereditary diatheses, it is burdened indeed.

Under the present head may be considered the changes wrought by removal to another country or climate.

The American dentist frequently has as patients foreigners that claim that, before immigrating, their teeth were in excellent condition. I call to mind among others a Swedish girl. She looked the picture of health. Her teeth were well-arranged and had ample room. Yet extensive decay was manifesting itself, though she had been only two years in America. Prior to her coming here she was blissfully unconscious of having a chewing-apparatus. Another patient, American, while in Paris pursuing art studies, had to make frequent visits to the dentist. When she went abroad, her teeth, I know, were in good repair. The French dentist informed her that she was sharing in the general experience of Americans sojourning in Paris.

These are of course individual cases, and should not be unreservedly taken as demonstrating a general fact. A grain of allowance must here be made for the complete change in the conditions of life. Then, too, worry and anxiety probably enter into consideration.

So far as I know, there is nothing in any country or climate that will act in a directly harmful manner upon the teeth. It is the *change* incident to removal that may, through the general system, result in increased liability to dental affections.

It is well known that the children of European parentage in India have a very low degree of physical vigor. No doubt had these children been born in Europe they would have probably been equally vigorous as their parents. But the climate itself of India must not be thought a cause of physical weakness. Fine development and good teeth are found in the aboriginal population of any inhabitable country. It is the persons "not to the manner born," or such as hereditarily belong to another country, that are likely to fail in health, and through this, as has been observed, in their teeth.

Prenatal Influences.—Much importance is attached, and justifiably so, to the attainment of vigorous health for women that are

approaching motherhood. The heritage will be strong teeth and a strong systemic support. Dr. Rich, who has devoted much attention to the physical culture of women, observes, "Experiments have been made under the auspices of the French government, which proved conclusively that by increasing the health of the mother during pregnancy a marked effect is produced upon the teeth of the child. Fine teeth depend upon fine health of the mother. The benefits of vigorous exercise, proper diet, and the means of promoting a high condition of health are well known. Look at the mothers in our highly-civilized community, and what are they? They are delicate in frame, poorly developed, with soft muscles. Who ever heard of a fine horse being produced by a miserable dam? There may be a scalawag father, but it is always necessary to have a fine dam in order to produce a fine horse. This principle exists throughout the whole animal kingdom, not excepting man." Dr. Dwinelle, another authority in matters dental, believes that the child comes into the world with too little phosphate of lime in his system, resulting eventually in poorly calcified teeth. He thinks that to obviate this defect the mother should receive a saturating phosphate treatment. For substantiation he cites illustrative cases in his practice.

Dr. Rich's opinion, if the necessary provision for hereditary influences (paternal as well as maternal) be made, is no doubt a sound one, and in thorough accord with natural conservation. The implied advice is conservative, in that natural—I may say physiological—methods are resorted to. The doctor places, however, too much of the blame for poor teeth on the mother. The father, too, is partly responsible for defective dental heritage.

Crossing.—Dr. Brinton, an eminent ethnologist, in speaking of mulattoes, says, "It is well ascertained in the United States that they are peculiarly prone to scrofula and consumption, unable to bear hard work, and shorter lived than either the full black or the white. This is not owing to our climate, as the same results are recognized by the negroes of the Gold Coast, who for four hundred years have been in constant contact with the whites. In the West India Islands the mulattoes must be constantly reinforced by new crossings, or they disappear."

Such is the effect upon the general system. In a limited way the crossing of races, and of nationalities, will result in defective or irregular teeth. This observation has been made in the offspring of white and Indian parentage. The same may be said of the cross between the black and the white races. Even the teeth of children

resulting from a union of Romanic and Germanic blood will often show, if not deteriorated tissual formation, at least irregularity of position, and that, as is well known, may lead up to positive lesion.

If we except the probable results of racial differences in the size of the jaws and the teeth of the parents, it is not likely that a cross between two pure types of races of sound physical development, living and brought up in practically the same climate, will have defective dental organs. In these days, however, such a case as just supposed would be hypothetical; most assuredly so as applied to white races.

The latter crossed with other races will undoubtedly confer upon the offspring a better brain-capacity than the inferior type possessed, but at the expense of a lowered physical development. It seems to show that civilized white man has removed himself quite far from nature. Since, as soon as he comes in contact with peoples nearer his condition, he entails upon them the physical penalties of an artificial life.

This ends the consideration of the remote factors.

But little need be said of the *immediate factors* in dental deterioration. They are *want of cleanliness*, *abuse*,—as in cracking hard nuts, and in similar feats of sleight of teeth; much *lemon-sucking*, and *eating* of *vinegar pickles* (school children offend in this way); *excessive indulgence* in acid phosphate; *acid medicinal preparations*, as lime-juice used as a gargle or the careless administration of *the chloride of iron tincture.*

The *eating* of *sweets* in moderation is harmless, but carried so far that the stomach is soured thereby, or the appetite for necessary food is taken away, it may result in indirect, if not direct, mischief to the dental organs. *Sudden thermal changes*, such as the teeth are subjected to at the table, may become injurious to the enamel, if not to the pulp as well. It must be hardy material, indeed, that can stand the taking of a gulp of ice-water on a gulp of hot soup. *Mouth-washes* and *tooth-powders* that are recommended to radically whiten the teeth and prevent decay are a source of harm. Professor Elliott is said to have analyzed one of these washes, and found it to contain eighteen per cent. concentrated *hydrochloric acid.* Another beautifying preparation is: water, one ounce; honey, two ounces; and *muriatic acid, one ounce*,—that is, twenty-five per cent. hydrochloric acid. The naïve directions are: "Mix, apply with a tooth-brush, and *rub vigorously.*" If this does not whiten teeth, nothing short of extraction or death of the patient will.

To briefly summarize: Man owes the deterioration of his teeth (and, in a measure, of the related parts) to change in the mode of life; to change in diet, both as to character and preparation; to reduced general physical vigor; to weakening hereditary or peculiar maternal influences; to luxury, indolence, vice, capricious appetites, sleep-robbing, brain-fretting; to local abuse,—in general, to the sins of omission and commission against hygiene; against the conditions that necessitate the presence of teeth.

Dr. Hammond, in a fit of pessimism, predicts that, at the present rate of increase in baldness, a thousand years hence the human race will be hairless. He might have added that, if the miller continues to improve the fineness of flour; if the cook continues to improve in the art of making dishes for the palate only, and to multiply the number of highly-seasoned, stomach-teasing compounds called "fancy dishes;" if the kitchen-stove continues to do our chewing for us; if we continue to despatch our food by the watch, and, instead of insalivating the morsel, send it down under convoy of iced water or scalding coffee; if we continue to limit our physical exercise to the rocking-chair or to the office-stool; if we continue to shun the sunshine and crawl out after night-fall; if we continue to let, as Shakespeare says, "sweaty haste . . . make the night joint-laborer with the day," a thousand years hence our successors will be (I won't say toothless, that's nonsense, but) practically without bicuspids and molars, and the wearing of plates or bridges will have become as common as the wearing of shoes.

One of the Alfonsos of Spain is quoted as saying that if he had been consulted in the making of the world, better work would have resulted. I suppose if he had been called upon to assist in a palingenesis of the world, he would have either made man with an indurated gum to do duty for teeth, or constructed the latter so that when one is lost another would take its place in some such way as lizard-tails and crab-claws are reproduced. However, as Alfonso was *not* consulted, we shall be obliged to make the best of our lot, and—*let the dentist live.*

THE TEETH AND THE FEET.[1]

BY THOMAS C. STELLWAGEN, M.D., D.D.S.[2]

THE possibility of any practical connection between the teeth and the feet, up to the present time, does not appear to have attracted the attention of dentists in proportion to the importance that the gravity of the consideration demands. The guidance of fond parents in their responsible and delightful duties, the interest that they feel in the rearing and the welfare of their growing children, the aim and desire that their offspring should all be paragons of perfection and beauty, both physically and mentally, make the subject one of nearly universal interest.

The neglect of the correlation of these organs may be due to their remote separation in the human structure, being such as to divorce them from simultaneous study. Likewise it may be, in no small degree, the outcome of what may be denominated the fashionable drift of thought that diverts the general public from observation of the feet; except in the small class made by the dancing-masters and foot-ball team captains.

Among the disadvantages of so called modern progress, some of the most useful tradespeople are to be seen within their shops, neglected in the onrush. Fear may be expressed lest the hurry of the nineteenth century has resulted in stamping out of existence the true shoemaker and substituting in his stead the great shoe-factories. The modern luxuries of carriages and palace railway cars, of bicycles and tricycles, with their wonderful records of great distances traversed within enormously diminished periods of time, combine to revolutionize the use of the feet as means of and organs for propulsion. These causes operate in diverting the thoughts from the humble but wonderful locomotors; in effect, relegating them from the great practical purposes of life to the degrading duty of displaying costly adornments that deplete the purse and cripple the self-supporting powers of the wearers. We should draw a lesson from the famous battle of Larissa[3] in Thessaly, about the year 988, when Bohemond, leader of the Normans against the Greeks, was defeated by the latter aiming their shafts to kill the horses, thus making the dismounted riders easy victims with their unwieldy

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[1] Read before the American Academy of Dental Science, February 3, 1892.

[2] Professor of Physiology, Philadelphia Dental College.

[3] Gibbon, vol. v. p. 474.

boots with toes two feet long, patterned after the form of scorpions. The tide of battle may be said to have turned upon the toes and heels of the Norman boots. Rarely has history more directly acknowledged the great importance of proper footwear. The deeds enacted by the feet upon the battle-fields were wonderful, where there hung in the balance such momentous affairs as revolutionized the thoughts and creeds of men, the very foundations of religious beliefs and moral enactments. By a stretch of imagination, the great and rapid marches of the German armies in the Franco-Prussian War, by inference somewhat distant and possible, may be accepted as an admission, although concealed from direct mention, that these troops must have been possessed of wonderfully good and useful feet.

Lest this thesis may be criticised for squandering too much of your valuable time, and paying too great tribute to the orthopedist's or chiropodist's functions rather than the odontologist's, it may be now asserted that the importance of the knowledge of how to properly care for the feet, as the basis of the whole bodily structure, will most profitably repay the specialists as well as the general practitioners of the healing art.

In the present era of science it is recognized by all who think of the philosophy of life-action that an ample supply of oxygen to each and every part of the living body is essential. By it the building of tissue, the storing and elimination of energy are brought about; upon it depends the no less practical functions for facilitating the economic removal and healthful disposal of the matters that otherwise would promptly become objectionable, effete, and often both harmful and dangerously threatening to life.

The micro-organic materials that in many diseases are abundant in the tissues of the body are now conceded to be most promptly and satisfactorily checked in their growth, formation, and multiplication by a luxuriant supply of vivifying and combining element, oxygen. The eradication of disease by destruction of the pathogenic microbes or their poisonous products and the abnormal cells of the tissues, the transformation of the multiform pathological germ-causes of sickness into harmless growths, are best performed and probably are only capable of accomplishment by the stimulation of the tissue-cells to their highest possible beneficial activities. These desirable changes are known to be responsive to such physical conditions as encourage and invite the lively mutation of combinations of the elements in the constructions and destructions of cell-substances, in obedience to the all-pervading laws of chemical

affinity. The higher forms of life are well known to flourish when furnished with enormous quantities and constant supplies of this gas, for completion and perfection of the metabolic transitions that are as intrinsically necessary to the perfection of each cell as the whole body is dependent upon its individual parts for its composition and integrity.

That the microbes are the sole and entire cause of all pathological phenomena, and are to be held as entirely blamable for each and every disease, has been modified in many ways by others, who, if not more deep, are at least more recent thinkers. The ptomaines that are formed by these wicked and idle microbes, and the schizomycetes, with their iconoclastic or catabolic and destroying propensities, are set down as the principal evil influences. Other students of these phenomena of death and destruction liken them to thieving mobs that run riot through the communities of the legitimate citizen-cells and filch from the latter their hard-earned oxygen. The conditions of the tissues that permit the formation of the nests for these pernicious growths are impossible when healthy nourishment is the rule. From all sides the conclusion is forced upon us that when the natural and lavish supply of this important element is maintained in and throughout the remotest tissues, the symptoms and serious effects of most diseases are either in great part mitigated or entirely banished from those parts of the economy of nature.

In the light of modern scientific investigation, the various tubercular and glandular swellings that are pathognomonic of the scrofulous diathesis are produced by the caseation of matters, which, under strictly physiological operation of the anabolic and catabolic cell-changes, should have been cast out in the forms of the natural excretas by the proper depurative organs. The respiratory, renal, and dermal systems, and the lower portion of the alimentary canal furnish the principal parts of the complicated and as yet only partially understood apparatuses that are charged with the very important duty of elimination of the excretory matters from the blood. This is most perfectly and economically performed after each nutritive, component, proximate principle has by combustion set free at least the major part of the energies that were stored up in the processes of cell formation and growth. The natural energy, that is latent in the various organs, at proper time exhibits itself by the phenomena of their functional action. In these changes oxygen plays the chief rôle.

Failure to remove by these means of depuration the worn-out

matter accumulated in the blood or the tissues is productive of disease. Even partial retentions and obstructions by these fecal matters in the alimentary canal are demonstrated often to be the precursory state that may be followed by a process of reabsorption and redistribution. The merest tyro in the healing art knows the dangers following these neglected duties that permit retention of matter that is more or less pernicious or violently poisonous. These products exert injurious influences and powers upon the tissues and cells that are bathed in them or assimilate them. By transmissions and harborings of these deleterious excretas in many tissues, the whole system is affected both directly and indirectly. Increase of the scavenger work to be accomplished in the communities of cells reduces the efficiency and the number of employés of the department of what might be compared to the public board of health in the commonwealth of the body.

The result of arrestation of the processes of digestion and absorption, even of healthy food, frequently is speedily followed by decomposition. Such degeneration of food-substances is most prompt at the temperature of the human body. This breaking down of the chemical compounds of the matters in the stomach and alimentary canal liberates gases that may in their turn be accountable for the painful sensations of distention of the containing portions of the digestive apparatus. The unnatural impingement and undue pressure upon their surroundings, together with the vast and unruly train of dyspeptic symptoms, follow. After centuries of suffering by untold millions of unfortunates, and expenditures of many more millions of money, in vain and often even unimaginable ways of research and attempt to discover a drug or remedy for the cure of this disease, the quest has been almost entirely unsuccessful. Like most human difficulties, it has been a simple, blind, and stupid one, raised by men's perverse disposition and stubborn persistence in the disregard and disobedience of the axiom of the divine command, "In the sweat of thy face shalt thou eat bread." (Genesis iii. 19.)

Physical labor, in a large majority of instances, is remarkably dependent upon the perfection of the adaptation of the feet to their very important and valuable purpose of serving as the foundations upon which the whole body is supported. The most superficial reference to architecture or construction will acquaint us with the rule that the perfection of a building, or superstructure, mainly depends upon the correctness of its foundation, in its adaptation to the support of its load.

The growth and development of the child is largely in proportion to the utility of its feet, and their capability of sustaining the various shocks and strains put upon them, which duty they should accomplish without undue fatigue or suffering. The passion young animals show for change of location, that is familiar to any who have noted the restlessness of children and that so frequently harasses and annoys the more elderly and sedate nurses or attendants, is but the natural outcome of the conservation and expenditure of nerve-force that, by its indulgence and exercise, stirs the muscular tissue to functional action, which is a powerful and natural cause of the healthful stimulation of the circulation of the blood. This, by reason of the wear and tear induced by use, causes an extra but not abnormal demand upon the digestive apparatus. In a word, it calls into play the various organs whose functions, when properly combined, only give forth harmonious interworking, and result in well-balanced development and growth.

No more thoroughly-accepted proposition can be quoted than that the restraint of the motions of young animals before they have attained their adult size and functions will cause them to be undersized, dwarfed, and often diseased and malformed. Observe the demonstration of this induction everywhere, and in all living voluntary moving beings. See how it is illustrated in the deficient hind limbs of large dogs that have been reared in close and confined quarters. This is shown where puppies have been kept chained to prevent them from injuring and destroying other animals or the surroundings of the houses, and disturbance of the households of their masters. An unnaturally peaked or pointed and elongated muzzle is found on such dogs, that may justly be said to speak louder than words, showing the corresponding lack of strength and breadth of both the maxillæ and their attached muscles.

Why go further than our daily experiences as dental practitioners for illustrations of these associations of causes and effects? Who are the children that we are obliged to treat for dental and oral irregularities? Do the unrestrained and healthy country-bred, barefooted urchins apply for the expanding apparatus for their dental arches? Is it not almost entirely prevalent among the miserable, dyspeptic, cramped, and tender-footed children who are unfortunate in the possession of parents and guardians, who have long been out of the line of common sense, and who are accustomed to outweigh the blessings of health and strength, by the morbid concern they evince for fashion and her proprieties? Does not the coveting of what is falsely termed social position make such rebels against chil-

dren's rights persuade themselves that it is a true kindness to squeeze out of all semblance of shapely usefulness the soft and readily-mouldable cartilaginous bones, under the silly pretext of protecting their innocents from harm, and cold, and injury? The modern shoes seem especially designed and constructed with greatest ingenuity to antagonize the growth, the elasticity, the mobility, and the strength of the wearer's feet. By breaking down the arches, these devices deform, hopelessly cripple the toes, and cause painful corns, bunions, and other abnormities of growth. The circulation of the blood, the nourishment of the tissues, the resistance to cold, the power of nutrition in general, are these not all impaired by the shoes of the civilized child? Can we longer look on such cruelty practised in the name of humanity and parental love without loss of patience and raising our voices to abate the evil? Alas, we cannot stop here, the ankles are bound so tightly as to almost produce anchylosis; their functions are almost obliterated for these little sufferers. Not content with cruelty to the feet alone, now fashion aims to destroy the whole leg and even the knees. Little Lord Fauntleroy has cursed his poor imitators with leathern gaiters, stiff and awkward, heavy and tiresome. Oh, mothers put on balls and chains, out-Herod the Celestials, afflict your boys as well as your girls,—go beyond China!

Need it be asked, How can such a bestocked, hampered, weary, exhausted child develop and enlarge his lungs, have an appetite for bone- or muscle-making food that the very force required for its mastication will spread the alveolar processes, and produce healthful nutrition and growth of the mouth and its associated systems of glands, of muscles, of bones, of mucous membrane, of teeth?

The desperate criminal galley-slave can carry his ball and chain in his hand. The thief in the stocks is not doomed for all day and every day in the week. Both of these have attained their full growth and will not be made sickly and dwarfed. In what have these children so sinned that they must suffer such refinement of torture, as causes one to shudder at the thought of its being applied lightly and gently to the worst and lowest classes of men exclusively? Are the children thus prevented from giving you and their attendants trouble by the noise and clattering of their feet, and by occasionally escaping while nurse is ogled by a policeman?

Be consistent, arm your children's keepers with guns, tell them to shoot, to kill, if the little ones cross the dead-line; but in the name of all that is healthy and good, let them be at liberty within their play-grounds. Let them have at least as fair opportunities in

their struggles with death, diphtheria, and denticulariæ, as the little urchin of the back alleys, who laugh at your pity for them in their bare feet, and take delight and pride in their designation "kid."

The practical side of this question for the orthodontist and the general odontologist should be to invite attention to the general system beginning at the feet as the foundation, and observe their adaptation to their work. If they or any portion of the locomotor apparatus are defective, it will greatly assist in the treatment of the mouth and of the teeth, if the part or parts of the body or limbs at fault be improved or corrected. Nature will be one of the most powerful means we can employ, even if only as an ally, in the stimulation of growth of the jaws. By proper exercise the appetite for suitable food will be begotten, and resulting from this will be practice in the use of the jaws in mastication. Then will awaken the dormant constructive action, and growth will be renewed.

The aim of this discourse is to emphasize a plea for the replacement of the morbid by healthy processes. It furthermore seems to be a proper question whether the very ingenious and complicated apparatus within the mouth, used for orthomorphia, has not cultivated too much reliance upon mechanical and too little regard for the natural means of correction. The presence of the apparatus for moving the teeth does not improve their masticatory functions, and although the expansion of the arches may be effected, still it might be assisted and hastened by the benefit derived from natural work. If the blood-flow be increased, nutrition of the bony support certainly will be a sequence of this functional activity. Chewing or biting upon a piece of hard wood, as recommended by the late Professor McQuillen, has often done more to expand arches and symmetrically arrange the teeth than whole drawers full of apparatus to be worn in the mouth and worked by springs, screws, and wedges. The flow of saliva that follows upon thought of sapid substances indicates the glandular action which results from a determination of the nutritive current to these parts, and is an illustration of the manner in which the control of secretions and growths are under nervous influences. Deprivation of pabulum to any part is quickly followed by sloughing. Diminution of the supply will result in proportionate arrestation of growth or development. If the lungs, the arms, the legs, or any portion of the economy is defective in size or texture, the most likely method of effecting repair of growth comes through judicious motion and

increased use. Why then will not a law so universal act for the benefit of the jaws? If this be true, will not such exercise as provokes healthy desire for food of the kind qualified to build up and replace the consumed and worn-out tissues react upon the jaws through the increase of their nerves and blood-currents?

Some observations that your essayist has made upon those afflicted with crippled and clubbed feet seem to point in this direction; for, if the cases viewed, are not by some remarkable series of chances very exceptional, the crippling of the feet in an undue number of cases is accompanied or more likely followed by the deformity of the dental arches. Indeed, a curious confirmation of the proposition may be mentioned, that in a great many of the exceptions to the association of dental abnormities with impaired power of the feet, there were discovered to be well-marked vicarious auxiliaries for locomotion in strong hands and arms to wield canes and crutches.

The following table shows the proportion of regular and irregular mouths among a series of children having crippled or deformed feet.

Boys. (*Over eight years.*)	
Regular	2
Slightly irregular	8
Irregular	7
Very irregular	7
Total	24

Boys. (*Eight years and under.*)	
Regular	5
Slightly irregular	6
Irregular	1
Total	12

Girls. (*Over eight years.*)	
Regular[1]	8
Slightly irregular	6
Irregular	8
Total	22

Girls. (*Eight years and under.*)	
Regular	2
Slightly irregular	2
Irregular	2
Total	6

[1] One walked until thirteen years of age. One crippled at ten years of age. A few cases have been seen since reading the paper and are included above.

DENTAL LITIGATION, PAST AND PRESENT.[1]

BY JOSEPH HEAD, M.D., D.D.S.

THIS paper is a plea for absolute confidence in the Dental Protective Association. It will endeavor to show why every dentist should not only be a member, but an active partisan, working in every way to lighten the burden of those few men who by arduous devotion are saving each dentist an annual tax of at least a hundred dollars.

The Sheffield Tooth-Crown Company is operated by the same men who have in times past made the Dental Vulcanite Company so formidable.

Many dentists have thought to escape molestation by refraining from the manufacture of Richmond crown- and bridge-work, but they have not appreciated the danger which threatened, and which undoubtedly would have overwhelmed them, had not a few unselfish men, led by Dr. Crouse, championed the rights of all dentists at the risk of imprisonment and heavy fines.

The Tooth-Crown Company have patents not only on the Richmond crown- and bridge-work, but in addition, their patents, numbering almost a hundred, include innumerable well-known daily operations.

If these claims be sustained in court, no man can legally invest a tooth for soldering, or cement in any crown whatsoever, whether it be held by band, pin, or screw. Neither can he take impressions or articulations. Numerous other cases could be quoted, but these are sufficient to show the injustice and weakness of their claims.

But because they are unjust or illegal they are none the less to be feared. They can only be rendered harmless by vigorous opposition and close organization.

A certain Mr. Josiah Bacon, treasurer of the Goodyear Dental Vulcanite Company, is quoted to have said, "I don't care whether a patent is good or not, give me money enough and I will put it through." And he proved his assertion.

In 1852, Dr. Cummings tried to get a patent on the process of making rubber dentures. He was not the inventor, but picked up the idea from dentists with whom he associated. In fact, so little did he know of the process, that he included gutta-percha among the vulcanizable substances. And at one time he actually hired a

[1] Read before the Odontological Society of Pennsylvania, May 12, 1892.

mechanical dentist to teach one of his students to make rubber plates, he himself not being competent.

From 1852 to 1854 he tried to get the patent, but, not having sufficient influence, failed. Then he abandoned all attempts until 1858, when he tried again, and was again refused. Still he persisted, until, with the aid of Josiah Bacon, treasurer of the Goodyear Dental Vulcanite Company, in 1864, he succeeded in getting a patent, embodying not only his original claim, but all improvements made by the profession up to that time.

The patent was issued in absolute violation of law and justice. Morally, he should not have had it, as he was not the real inventor. Technically, he should not have had it, because the laws forbid a patent to be issued for a method where a well-known substance is applied to a well-known process. This law directly applied to the case in point, as teeth had previously been flasked for the purpose of making plates of metal, which was poured into the mould. Again, the laws say, "No patent can be granted for a process that has been in general use two years previous to the petition." There are many other laws which applied, but these two alone were sufficient to render the patent unsound.

Mr. Bacon, who had bought this patent, did not care whether it was sound or not. He was about to prove his boast that a good or bad patent could be made successful with plenty of money. He wanted this, because it would extend the Goodyear patent nine years, so far as it related to artificial dentures.

When Cummings's patent was issued, there was a terrific storm of indignation throughout the country. Protests from individual dentists were presented on all sides, but there was no organization for vigorous opposition, as the Goodyear patent, covering the same ground, had yet several years to run. So the storm subsided, and the wily Vulcanite Company succeeded.

The story runs as follows: A certain Dr. Newbrough invented a process for hardening rubber by iodine, and issued licenses to several dentists offering to protect them from any suit that might be brought against them by Bacon & Co. Among these licensees was E. B. Gardner, against whom the Vulcanite Company brought suit for using iodized rubber, claiming that it was an infringement on the Cummings patent.

According to his agreement, Dr. Newbrough undertook Gardner's defence. Then Bacon proved his boast: he compromised with Newbrough, contracting to give him a share in the profits of the Vulcanite Company in exchange for all his patents. Next he en-

gaged Newbrough's attorney to continue the Gardner case and finally permit the Vulcanite Company to win. Thus would the validity of the Cummings patent be established.

In proof of these statements it may be of interest to quote Dr Newbrough's sworn testimony before the United States Supreme Court, bearing the date 1871, which may be found printed in full on page 190 of the *Dental Cosmos*, vol. xv. After a description of his patent he says, "Among my licensees was Dr. Benzoni E. Gardner, of Providence, R. I. In September, 1868, Dr. Gardner sent me a writ which had been served upon him at the suit of the Goodyear Dental Vulcanite Company and Josiah Bacon.

"Having been advised that my patents and their use involved no infringement of the Cummings patent, I was not unprepared for litigation, and promptly assumed the defence of my licensee, Dr Gardner. The answer was filed after a preliminary injunction had been granted after argument. This ended the proceedings in the Gardner case, except as hereinafter explained. Previous to the Gardner suit in Rhode Island the same complainants had sued me in this district, and I was proceeding duly with my defence.

"No testimony was ever taken in the Gardner case except the affidavits used on motion for the injunction, but the testimony that afterwards went to make up the Gardner record was stipulated into it out of other suits. On the first day of July, A.D. 1869, a written compromise was executed between the Goodyear Dental Vulcanite Company, Josiah Bacon, and John H. Cheever, Henry E Ficket, and myself, dismissing all the suits against myself, and I introduced into that compromise the dismissal of the suit against Gardner also, because, as I was the real defendant of his case, I regarded that as involving myself, and so settled it in the above mentioned compromise by giving him a free license during the term of all the Goodyear Dental Vulcanite Company's patents. With the execution of this in writing all the then pending questions between the company, my licensees, and myself were finally settled and terminated, and from that time forward I have not in any manner controlled, directed, or participated in any defence or proceedings in the Gardner or the other suits above mentioned; but, on the contrary, my only interest in any of the matters has been that which I had in common with the company under the aforesaid compromise. After this compromise was effected, and as a matter of personal friendship to John A. Foster, and also to prevent the dentists from employing him against our then common interest, I did then get the company to take Mr. Foster as one of their lawyers

and he told me from time to time that the Goodyear Dental Vulcanite Company has paid him since July 1, 1869, for all services performed by him in the Gardner case; that after the argument of that case in Washington, before Judge Clifford, Mr. Foster told me that the company had paid him two thousand two hundred dollars for compiling the case. I remember this distinctly, because Mr. Foster told me at the same time that he would never have got his money from the company if he had not threatened 'to blow on the whole thing;' meaning, as I understood, to let the dentists know that it was a put-up job.

"I remember that shortly after my compromise the lawyers who were conducting the case concluded to put in all the testimony for both sides, so that, should the collusive suit be discovered, the testimony would be so fairly put in that their complicity in the matter would not involve themselves; and further, that after the case was ready for argument the dentists were to be informed of the fact, and induced to accept the case, as then prepared, so that they might take part or not as they chose.

(Signed) "J. B. NEWBROUGH."

This contract was carried out September 8, 1870. No defence was made. The evidence was all in favor of the Goodyear Rubber Company, and from that time a new reign of terror was inaugurated. The Cummings patent had been legalized. Still they were not satisfied; but, to make their position more secure, Newbrough appealed the Gardner case to the Supreme Court. Bacon won this suit also. And thus the illegal Cummings patent would have been secure and impregnable if the contracting parties had not quarrelled.

Then the dentists combined and asked for a new trial. In view of the collusion exposed, the courts granted their request. That, however, the Vulcanite Company eventually won is a matter of history.

The dentists, with their loose and imperfect organization, were an easy prey. Henceforth each dentist who made rubber plates had to pay a tax varying from seventy-five to one hundred and twenty-five dollars a year, and was compelled to keep his books always open to the scrutiny of the Vulcanite agents. Failing to do this, he was liable to fine and imprisonment.

This story should teach an impressive lesson. Since unscrupulous corporations by mere force of money and influence can prey upon the individual dentist, can ruin the practitioner by expensive

lawsuits, no matter how just his cause may be, since these facts are indisputable, there can be but one remedy. The dentists must also form a corporation for the purposes of self-defence. And this is what has been done. If for the use of one patent the old Vulcanite Company charged seventy-five to one hundred and twenty-five dollars per annum, what must necessarily be the result if the Tooth-Crown Company succeed in levying taxes on their eighty or ninety patents?

This company, up to this time, has been restrained by Dr. Crouse and his associates, who have had not only the courage to defy these powerful foes, but also the keenness to expose their methods. The Dental Protective Association lawyers are not to be bribed or corrupted, and thus suit after suit of the Tooth-Crown Company has been withdrawn in the face of overwhelming contrary evidence. They stand fully under the control of the Dental Protective Association.

Bacon would no doubt now be a moving factor in the new company if he had not been shot by a dentist whom he had hounded to the verge of desperation.

What, then, does this state of affairs mean? It means that the leaders of the Dental Protective Association have proved themselves worthy of implicit confidence. It means that any dentist now refusing to join is like the man who built his house upon the sands. For in a short time, when a full list of members of the association shall be published, those without the association will be left at the mercy of the Tooth-Crown agents, and will only be allowed to enter the protecting fold by paying an entrance fee of many times the present assessment.

The dentists are not asked to subscribe money towards fighting a doubtful battle: the victory has already been won. They are simply asked to pay ten dollars towards a campaign which in times past has saved them hundreds of dollars, and which in times to come will be a strong guarantee against oppression.

If, however, through selfishness or shortsightedness, many stay outside, they must not complain if they meet the fate of stragglers on the field of battle, who are captured or slain by the flying foe.

The Dental Protective Association is an assured success. And every dentist should gladly give ten dollars to an organization so capable and trustworthy.

SOME OBSERVATIONS ON THE USE OF COPPER AMALGAM.[1]

BY DR. J. ALLEN OSMUN, NEWARK, N. J.

Mr. President and Gentlemen,—With the invitation to present a paper here to-night also came the suggestion that its subject should be copper amalgam.

If I had followed my own option in the selection of a subject I think I should have chosen another theme for our consideration, not because that there is not an abundant field open for thought and investigation. No one, I take it, has the assurance to pretend that copper amalgam is the universal plastic filling-material, although, only a very short time ago, it certainly looked as if this claim would be made; and, on the other hand, to make the assertion that it is without merit is, to my mind, equally absurd.

The literature of copper amalgam is quite meagre, although every now and again some one comes forward who says he used it many years ago. But to all practical ends it is a comparatively new agent for filling teeth, and it was not until the summer of 1887, I think that is the year, on the appearance of an article published in the *Independent Practitioner*, by Dr. George H. Weygant, of Canada, that the attention of the dental profession was arrested and the general use of this material for fillings adopted.[2] My own use dates from this time. At first I was very sceptical as to its merits, but, upon using and watching it carefully, became convinced that, for a certain class of teeth and for buccal and approximal cavities, it possessed undoubted merits. Dr. Weygant says that he searched diligently through all the dental literature available to obtain information upon this subject. Reports of societies, correspondences, chemistries, encyclopædias, scientific works, were silent upon it. I can substantiate all this, because I have searched in vain for light, and could not find anything of much interest bearing on it. Although copper as an ingredient of amalgams has long been recognized, and testimony varies as to its good and bad qualities in such combinations, it has always been a source of wonder to me that it was received with so much favor, and can only account for it by the fact that in the class of teeth I

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[1] Read at a meeting of the New York Odontological Society, April 19, 1892.

[2] Copper amalgam was employed as a filling-material in Germany in 1879. Its use or manufacture did not originate in this country.—[Ed].

have in mind and the kind of cavities just mentioned, other amalgams have been found thoroughly unreliable, and when the report got abroad that copper amalgam neither shrank nor bulged, and that after months of use showed perfect margins, it was received with joy.

Copper amalgam has received since its introduction the most extravagant praise and the most severe denunciation. I am not prepared to admit that the goodness comes from an innate righteousness, or the badness from total depravity; or, on the other hand, that all its peculiar conduct is caused by its environment, but am fully persuaded that there is a principle involved, which, if it could only be discovered, would overcome all of its vagaries.

Dr. W. B. Ames, of Chicago, in a paper read before the Mississippi Valley Dental Society, and published in the *Dental Review* of April, 1891, takes the position that he is of the opinion that to too much grinding, while in the process of manufacture and by the operator before placing the mass in the cavity, is due largely the cause of the washing or cupping out of amalgam fillings. He attributes this fact to be largely caused by the establishment of an electric current acting on the free copper. While giving Dr. Ames great credit for his conclusions as to the theory of the electric chemical action, I am not fully clear in my own mind that this can be the cause, but only a factor, and that the cause must be looked for in the manipulation, and that grinding the mass is not the reason for failure in the use of copper amalgam.

To the more full comprehension of my theory as regards the peculiar conduct of this filling-material I desire to recapitulate and group together the more prominent and peculiar results observed in the different mouths that have come under my own eyes.

1. We all have seen cases that have filled us with admiration, black but clean fillings, hard as adamant, and edges absolutely perfect,—the ideal plastic filling.

2. Then, again, we have observed fillings, black, but dirty in appearance, teeth in the immediate neighborhood all discolored with the stain of the disintegrated filling, probably the black sulphuret of mercury, referred to in Dr. Ames's paper,—however, saving the teeth as far as recurrence of decay.

3. The third class of fillings is very much like the preceding, only with this difference: that at the cervical edge we find that the filling has decomposed, and in some cases entirely wasted, so that it does not afford the tooth any protection; in fact, it resembles, to a great extent, the phenomenon observed with the oxyphosphate

llings, and leads one to the conviction that the same agent is re-
ponsible for this condition of affairs. This I consider one of the
ost deplorable situations that can possibly exist. Much more so
an the other which is so familiar, and has brought copper amal-
am fillings into such disrepute, and which I assign to the fourth
lass.

4. Where we find the filling-material of a light- or dull-gray
olor softened, and in some cases to such an extent as to be easily
emoved with an excavator, while in others it simply is washed
way, leaving a hard, glassy appearance, yet not hard enough to
esist whatever the agent may be, and slowly the fillings cup.
'et this is not so dangerous to the welfare and preservation of the
ooth as that class of fillings just mentioned which give way at the
ervical edge, because, in the one case, no knowledge is had until
reat mischief is accomplished, while in the latter case it gives
ay from the outside surface, and the patient is conscious that
omething is radically wrong and hence seeks relief.

It does not seem plausible that all of these different conditions
an exist sometimes in the same mouth, which I have repeatedly
een, and the cause be attributed to the environment. Referring
gain to Dr. Ames's article, where he says "that it is unreasonable
o suppose that there was ever a condition of the saliva sufficiently
cid to dissolve copper and mercury to the extent we often see, . . .
nless the action was in some way intensified,—as these metals are
nly soluble in nitric acid, and the more powerful nitro-muriatic,"
nd then goes on to show that the current is established by the
nvironment and the metals setting up a continuous current that
ssolves the filling.

This theory presents a very plausible and enticing solution of
ie question, and yet I cannot see my way to fully endorse or accept
, because in so many cases in the same mouth and, so far as can
o ascertained, with exactly the same conditions as to location of
ling, with the same character of saliva, we find the "very, very
ood" and the "horrid." I am of the opinion that the cause must
o looked for in another direction.

It has been generally accepted that the agent that decomposed
ese fillings is an acid; yet in many tests made with litmus-paper
have repeatedly found an alkaline reaction, and in many mouths,
at were intensely acid, we have observed perfect fillings. Dr.
nes, in a personal letter received a short time since, admits that
has also observed this peculiar condition. This is one of the
ficult problems to solve, for if we always found that copper

amalgam fillings decomposed in the mouth in acid fluids, or alway in alkaline surroundings, then we could perhaps sooner find a solu tion. This leads me to come to the conclusion that the cause mus be looked for in some other direction,—possibly that the enviror ment may be a predisposing, but not the real cause.

I have not been able to get any information upon the result obtained in the use of "Sullivan's cement." I have written t many persons, but have not up to the present had any ligh thrown upon it. It has been universally admitted that it was fea fully dirty to use, and that it not only discolored itself,—that is, th filling,—but that it turned the tooth almost as black as the filling but I cannot find out to a certainty about the decomposition of th filling-material. Perhaps we shall have this point of difficult settled here to-night in the discussion.

I have long contended that the fault of all these different cor ditions could be laid to either imperfect methods of manufacturin or some defect in preparing the material by the operator.

As to the methods of manufacturing, I am not well enoug informed, or have not had an experience which would justify a expression of opinion; but I have a positive judgment as to th preparation of the material by the operator. My experience ha been confined almost exclusively to Weygant's, Ames's, and th S. S. White, and, to some extent, to Russell's productions. I fin but little difference in the working qualities of these differen varieties, and I think there is but little in the length of time tha they last. In the first use of copper amalgam by the professior the one great point was to get the material to solidify in the cavit within a reasonable time. Heat and rubbing were recognized a the important agents used to obtain this end, and it was soon recog nized that the more heat applied the longer it took to become hard Then it became apparent that there was too much mercury used and an effort was made by many manufacturers to produce a drye amalgam. I presume, in compliance with a feeling expressed by friend of mine, who said he would rather buy his mercury at a les price than was asked for copper amalgam, Dr. Ames put upon th market, as well as Dr. Russell, a dry copper amalgam. It had th great fault that in applying heat sufficient to make it work properl it was extremely likely to be burned and oxidized, and rendere thoroughly unfit for use. We want sufficient mercury in it, so tha when it is heated it will soften without fear of destroying it chemical relation. Some very peculiar experiences were had in th use of this material when it came into general use. One gentlema

told me that he put in a filling early in the morning, and that he examined it late in the afternoon, and he found that it was just as he had left it, and so far as he could ascertain it had not hardened at all. Now, we all admit that this was produced by too much mercury being left in the material, with the application of too much heat.

I am compelled again to quote Dr. Ames, simply from the fact that I regard him as a most careful and thorough investigator, and it does seem strange that his conclusions should be so entirely different from those I am endeavoring to present to you to-night from my stand-point. He says that he has become convinced "that all or any grinding was bad for the material, . . . and that as little heat be used as is possible to get it into shape to be placed in the cavity." Dr. Weygant also makes this same observation, while another gentleman states that the material having commenced to "set" before being placed in the cavity, is the reason for the cause of failure of the filling. My own experience has been quite the opposite of this. I have had far better results when I heated the material a good deal, given it thorough trituration, and removing all the mercury possible, leaving the material so it could be worked. In fact, those fillings that have stood the very best, where the material has left a stain on my hand while working it, resembling copper in color, which once seen can always be recognized.

I have therefore come to the conclusion that for the successful working of copper amalgam we must have the material as free as possible of mercury, as this is unquestionably only a solvent, having no strength in itself, and any excess weakening the material. It may be true, as Dr. Ames has so ably pointed out, there is a current established in the mouth by the presence of weak acids, and this may be the agent that produces the mischief; but, nevertheless, we can readily see that this is not always the case, for, as has been already mentioned, in the same mouth, with the same conditions as to weak acids, the contiguous position of other kinds of fillings, crowns, etc., do not present the same characteristics; but the fact is, that in many such mouths you find good, bad, and indifferent fillings, so I think that, as a gentleman known somewhat to fame once said, "this is not a theory but a condition that confronts us." We can accept the sentiment in the case of copper amalgam.

I have corresponded with a number of well-known practitioners, and their experiences seem to justify the conclusion that all the difficulties can be traced to improper manipulation in the preparation of the material. I fully coincide with both Dr. Ames and

Weygant, that excessive heating produces deplorable results; but that heat is the one great agent to obtain a good filling-material I am fully persuaded. Take, for instance, by way of illustration, steel; you heat it to a white heat, and you have ruined it; it is absolutely worthless. Take the same piece, heat it moderately, manipulate it by pounding it, and the more times you heat it and work it, the more tough and tenacious it becomes. My own experience in the use of copper amalgam justifies this theory. I have taken out fillings of this material that were soft and of no value in saving the teeth, and put right back in the same cavities with the same surrounding conditions. If a copper amalgam filling be worked as I am endeavoring to demonstrate, heating many times, with thorough rubbing, clearing them of all excess of mercury, they will stand the test in every way, and become a thing of beauty and a joy forever. In other words, we must temper the copper that constitutes so important a factor. That copper is susceptible of tempering, I think can be demonstrated.

Another important factor in the successful working of copper amalgam, in addition to heat and rubbing and getting clear of all surplus mercury, is force in placing the material in the cavity. There must be much burnishing and force used in working this amalgam, and to the want of it, I think, can be attributed to a certain degree some of the failures which occur at the cervical edge just referred to; and in addition to all this, to have the cavity as free from moisture as possible. Copper amalgam has great affinity for moisture, and while it has been claimed that it will save a tooth even if put in under water, the fact remains that the safety and permanence of that filling would be better assured if worked dry. Then, again, for the successful working of copper amalgam one must use discretion and judgment. It is not a panacea for all the cavities that come under our observation, neither does it offer a premium on defective preparation of the cavity, or slothful methods of insertion. Gold is admitted by all as the royal filling material, yet no operator of to-day claims that it is good practice to use it in all classes of teeth, or in all the cavities that present themselves for treatment. Yet we often hear this question asked "What amalgam do you use?" implying by the question, do you find one amalgam that will fit all kinds and conditions. Copper amalgam from my experience, justifies me in coming to the conclusion that there is a subtle principle involved somewhere, either in the manufacture or in the manipulation by the operator, that produces all of the various manifestations, and for this reason, if we found a

of the fillings in a certain mouth in exactly the same condition, and the fillings in another mouth bearing the same relation to each other, then we could, I think, very appropriately assign the cause to environment. I do not want to be understood as claiming that environment plays no part in the disintegration of the fillings, but that it is only one factor, helped on by an improper preparation of the material. I am fully persuaded that this filling has many good qualities to recommend it to our favor; but that it must be used carefully and with good judgment admits of no argument.

COPPER AMALGAM.[1]

BY DR. S. B. PALMER, SYRACUSE, N. Y.

You ask for my conclusions regarding copper amalgam. I am glad to exchange my views, which are from a scientific stand-point, with others of more practical knowledge. The following reasons have hindered the use of copper amalgam in my practice to *an extent* that I very much desire to be set right, if in error, and thus secure the benefits which this material offers.

I cannot express my conclusions without giving some of the principles upon which they are based. Copper amalgam differs from that ordinarily used, in this particular: it is composed of two elements, copper and mercury, while that generally used is composed of an alloy containing two or more metals, which is of importance, as may be seen farther on. Copper amalgam must be unreliable that is not uniform in its tooth-saving properties, for the following reasons: Two metals are united in a mass and exposed to fluids which are liable to dissolve either copper or mercury, or to act upon the two, and by such action polarize the elements or form a protecting compound surface, which the fluids will not dissolve. In this case only is copper amalgam a success.

In the process of amalgamation neither metal loses its identity. When the fluids find affinity in copper it is dissolved,—the surface of such plugs remains white, the fillings are soft and waste rapidly. When mercury is taken away the surface of the plug looks brown and spongy. With amalgam made from alloy there is this advantage: instead of the electro-chemical change being confined to one ele-

[1] Read at a meeting of the New York Odontological Society, held April 19, 1892.

ment, it is shared by all that compose the plug, including the mercury. To explain: in copper amalgam there are only two metals; either is liable to the positive one in an alloy, say, of silver and tin; the mercury enters into the compound to make comparatively one of three instead of two elements,—that is, there is little or no free mercury. Let us imagine there is mercury which is not absorbed or satisfied by the other metals, the same holds different relations to the plug proper from that of pure copper, because by the amalgamation of the silver and tin, an element is present containing mercury which greatly reduces the potential.

In good amalgams the plugs are not dissolved beneath a surface of mercury.

Copper amalgam may be heated and the two metals so separated as to become plastic; not so with alloys, because mercury is a part of the whole. The operations of a simple battery teach a lesson well worth notice. The object of a battery is to furnish a current. The requirements of an amalgam plug is to avoid a current, or dissolution of the elements. Commercial zinc contains other metals which, by local currents, oxidizes the surface and retards action. The surface of the plate is amalgamated, and in effect there are two elements,—mercury and zinc,—whereas in copper amalgam it is mercury and copper; add to the zinc silver, tin, copper, etc., the mercury would be taken up and the element become useless for battery purposes.

The above reasons have prevented the introduction of copper amalgam in my practice.

AMALGAM AS A FILLING-MATERIAL.[1]

BY WILLIAM P. COOKE, D.M.D.

It is now nearly sixty years since this material was introduced to the dental profession. The history of its use is full of interest From its first introduction into this country, in New York City in 1833, by the Croucours, who were rated as quacks, till the present time, we find it in continual use as a tooth-saver.

Its first advent was under very unfavorable circumstances. Al that the leaders in the profession could say against it was said. Th

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[1] Read before the Harvard Odontological Society, April 28, 1892.

controversy was carried into the press, producing a public feeling n opposition to it. It was denounced by dental societies even to the expulsion of all members who would not sign a pledge not to use it.

In a few years this pledge was rescinded, but the society was unable to survive its misdeeds and disbanded.

In 1859 the editor of the *Dental Cosmos* said, "We did not suppose that any one would venture to publicly advocate it after so many able men have failed to sustain it."

Preparations used.—The early fillings were made from silver coin; they saved the teeth well, but turned them dark.

Cadmium was introduced by Dr. Evans, of Paris, and was first discarded by him; it caused the dentine to become soft.

It is not necessary to name the different metals or the proportion n which they have been used, only to remark that as a rule the best ooth-savers have been those alloys that turned dark.

During the past few years copper amalgam—not copper in combination with other metals (whose merit has been long recognized), but copper and mercury—has been used extensively. It has been discussed in dental societies, manufactured and sold with profit by he dental depots, and used without profit by the dental profession.

It may be called one of the black spots in our history. Let us now look at a few of the causes which aided in the introduction of malgam.

1. A large class of teeth could not be saved by non-cohesive gold llings. These teeth were extracted. It was found that amalgam id save these teeth, many of them that had been filled several imes with gold.

2. The introduction of cohesive gold and its extensive use marked nother dark spot in our history. Because one piece of gold would tick to another and contour could be restored, many monuments ere built which brought ruin to the teeth, disappointment to the atient, and chagrin and loss of reputation to the operator. Aside om all this, the damage to the patient's health by the long operations, the dread and fear produced in the public mind concerning ur calling, are results the magnitude of which we cannot estimate.

3. The introduction of cement and the failure of the same also repared the way for amalgam. What wonder that some people ould have adopted an idea that filling teeth did not save them, hen we consider the various cements used, which were carefully repared by our dental manufacturers, quickly inserted by the dentist, and as promptly dissolved by the fluids of the mouth.

All of these failures prepared the way for a more extended and proper use of amalgam.

The New Departure advocates, in 1879, began to emphasize the use of plastics, with good results.

Uses.—Amalgams have been found useful in the following cases:

1. In temporary teeth.
2. In setting crowns.
3. In large and inaccessible cavities.
4. In patching gold fillings.
5. In compound fillings especially. (Dr. Clapp's method.)
6. In compound fillings combined with oxyphosphate.

One of our ablest practitioners recently told me that without amalgam one-third of the teeth he now saved would be lost.

I saw yesterday a large filling, crown and distal, in a lower molar that had preserved the tooth perfectly for twenty-four years, the pulp was dead at the time of filling, and through a perforation in the gum at the point of bifurcation of the roots blood came very freely at the time of filling. I think no other material would have served as well.

To many the color is a serious objection; this is less so than formerly, and now, by the use of Dr. Clapp's combination fillings, may be avoided. The change of color which occurs in some cases does not give us an artistic filling, but does not apparently interfere with its preservative action. Change of shape does not always occur, and in many cases may be due to improper shaping of the cavity, in others to the amalgam being poorly mixed; the alloy should be thoroughly united with the mercury in a mortar, not mixed like water and sawdust.

Who is responsible for that abominable impression in the minds of most patients that gold is the best material to fill teeth with? Who has, at the expense of time, money, and nervous force inserted these large gold fillings which have too often proved failures? Do you call such things evidence of skill? We maintain that the length of an operation is not evidence of it. The insertion of a gutta-percha or amalgam filling in an inaccessible place often requires more skill than the filling of a large cavity with gold. "Man makes the material, not material the man." Is there anything worse for a man who wishes to be lazy and yield to the easy way of doing an operation regardless of what is best for the patient, than the unrestricted use of the oxyphosphate fillings, which stick in a cavity where an amalgam would fall out. Cavities must be shaped, at least, to hold an amalgam filling. One of

the most brilliant operators our school has ever graduated confessed to me that the use of oxyphosphate and gutta-percha fillings unfitted him for extensive gold operations.

We have had our experience with copper amalgam. We have seen very excellent results, some passable and others that were bad. It does in some cases dissolve at the cervical margin, and any filling, whatever may be the preservative action of its several component parts, if, when in combination, they easily dissolve, we cannot consider it a safe material to use. One other objection arising from this same defect is that, although inserted when the condition of the mouth may be such that the fillings do excellent service, changes may occur in the health of the patient which make the filling an undesirable one. We have, therefore, discarded it.

The question of its effects on the system is a serious one. If it does poison our patients we must not use it, better that the teeth be lost than that the whole body should suffer harm. For sixty years the cry has been salivation. As Goliath of Gath brought terror to the hearts of the Israelites, so this monster mercury, which by injudicious use had wrought ravages in the ranks of medical patients, has brought alarm to this generation, because amalgam fillings contain mercury. Probably ninety per cent. of people having teeth filled have at some time had an amalgam. We have here to-night an accumulated practice of what would be to one man at least a century of experience. How many cases did you ever see that were salivated? How many that you could positively say were in any way injured by an amalgam filling? How many poisonous results did you ever observe from the mixing of amalgam fillings in the hand?

The early objections to amalgam was that it produced alveolar abscess, exostosis, necrosis, and might cause ptyalism. In 1872 we had a case reported in the *Dental Cosmos* of death from an amalgam filling, but the verdict could have been gutta-percha as far as symptoms were concerned, alveolar abscess being the probable cause.

No testimony of salivation from amalgam which occurred previous to 1870–75 should have any weight, as the results claimed to have been caused by the mercury may have come from pyorrhœa alveolaris, which disease was not generally recognized previous to that time. A case in point was given me a few days ago by a brother practitioner.[1]

A patient was being treated for syphilis by his physician; mer-

[1] Transactions of the American Dental Association, 1884, p. 68.

cury was used, causing salivation, which did not cease on the remedy being discontinued for three months. By the advice of his physician he consulted a dentist, who found the usual deposit of black tartar under the gum, which he removed. In two weeks the patient went back to his physician cured of salivation, and the mercury treatment being continued, salivation did not occur again. The experiment of Dr. Bogue, 1875, proves that no mercury is dissolved by the acids in the saliva.

A few weeks ago in discussing this subject in this Society, it was regretted that the dental and medical profession could not come to a better understanding in this matter. Such an understanding which would give us the truth would be one greatly to be desired, but we have different points of viewing this question. A physician's diagnosis on a dental case is, as a rule, unreliable. The profession have not been interested in the etiology and treatment of these cases. If we had a chair of dentistry in each medical school it would help somewhat, but even under these circumstances we cannot hope to harmonize dentistry, as now practised, with that branch of medical science that dispenses so-called high potencies.

Poisoning from corrosive sublimate is charged upon us by the medical profession. (Read, S. C., 1874–79, 213.)

Dr. Frances, of New York, reports a case where a patient of his was told by her physician that the poison in the fillings antagonized the remedies he was giving her. She believed him, went to her dentist, who discovered five gutta-percha and two tin fillings.

Such results follow where mercury is not present, but what disastrous effects may be realized from the vapor of mercury coming into the sleeping-apartments of people who have several large mirrors therein!

We cannot now say that harm does not occur, but can you assert that the quantities of zinc oxide from the plastic fillings taken into the system do not cause cancer? I had a friend who died of cancer some few months after having an oxyphosphate filling inserted. May not the free acid in an oxyphosphate filling cause disease? You may smile at the idea, but with the concurrence of a very few physicians a dentist could cause great fear to fall upon the people who have these fillings inserted in this city of ours.

I had a patient who was attacked with iritis; he had had several attacks before; was treated by a regular practitioner, but not cured. A friend mentioned his case to a Christian scientist, who treated him without seeing him, his eye was cured almost immediately, though in previous attacks he had been confined to a dark

room for two months. Is regular medicine, therefore, a failure? A patient has two or three small amalgam fillings removed. Seen a year later, she says she has had better health the past winter than the previous year; amalgam fillings are, therefore, poisonous.

The profession has waited sixty years for the proof that an amalgam filling can produce disease. It still waits for it. Tons of this material are used annually in this country alone. Is there *one* cavity which can be better filled by its use than by the use of any other material? And we have tied our hands so that we cannot use it, we have failed where we might have succeeded, and the ideal practice is not ours.

Reports of Society Meetings.

NEW YORK ODONTOLOGICAL SOCIETY.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening April 19, 1892, at the New York Academy of Medicine, No. 17 West Forty-third Street, with the President, Dr. Woodward in the chair.

The minutes of the previous meeting were read and approved.

Dr. J. Allen Osmun, of Newark, N. J., then read the following paper, entitled "Some Observations on the Use of Copper Amalgam."

(For Dr. Osmun's paper, see page 515.)

DISCUSSION.

Dr. Hart.—I was rather surprised to hear the essayist state that the working qualities of Weygant's amalgam and Dr. Russell's preparation were the same. While I have worked with both, I had some little success with Weygant's, and none at all with the other. I attributed my failures to the fact that Russell's preparation was turned on the market with such a small quantity of mercury. In nearly every instance, before I could get the amalgam to work, I heated the preparation; Weygant's would bubble freely before it was brought to such a high degree of heat. I must also take exception to the statement made that the copper amalgam was equally good in approximal fillings as in buccal cavities. The buccal fillings seem to last, and in very few instances did they fail to

crystallize. I have had some failures, like those mentioned by the essayist, where the fillings could be cut out freely with a spoon excavator, while in the same mouth other amalgams were doing good work. It leaves one in rather an uncomfortable position, because the operator does not always know where to select the case in which to use it. Some fillings make you think that you could introduce it in all. The patients are seen at some future time, and the fillings are found a dismal failure.

Dr. Bogue.—No doubt there are many gentlemen present who have used it more than I have, although I doubt whether any have longer. The last speaker's remarks would seem to indicate that he, too, had come across various methods, and possibly various preparations. I do not think we sufficiently well define ourselves, when we are speaking of these materials. For example,—we all know what a galvano-plastic plate is, and have looked at copper plates thrown down by the action of a galvanic battery with some amusement; but our Newark friends have discovered that if a solution of gold is sufficiently attenuated, very weak, and the battery is sufficiently weak, gold plate can be cast down so as to produce an almost uniform thickness of great density and strength. That same truth is applicable to copper amalgam. When the solution from which the amalgam is made is exceedingly attenuated, and is thrown down gradually, the product is a fine amalgam which will take the imprint of the cavity or the end of the fingers very accurately. If it is allowed to harden, and is then softened again by heat, and squeezed, and again hardened and again softened and thoroughly squeezed, you will get a product which will go into a cavity very accurately, and will produce an amalgam upon which no excavator that I have come across will have any effect. It does not readily waste. Even the burr will not take it out sometimes. Copper amalgam made by some of the rapid galvanic processes does not seem to be fine-grained enough. It is gritty, and you cannot get a good filling. I do not know why. The only copper amalgam of which I know anything at all is the one made after Rogers's formula, and is made after the process of which I speak. The galvanic current is exceedingly weak. It took several days to deposit copper enough to answer my purposes in the office. That copper amalgam, when the mercury had been pressed out several times, has done excellent service.

I do not use it often, but it is good for the restoration of breaks in the back of the mouth. It has answered a purpose that nothing else than palladium has accomplished. I would like to tell of some-

thing that has caused me much trouble and cost some money to learn. There is to-day but one house in the world where you can buy precipitated palladium. That is Johnson, Matthey & Co., 79 Hatton Garden, London. I asked Ash for some, and inquired for the address of the firm, but he would not give it to me; but said he would procure it and be responsible for it. He did procure some, but I could not use it; it was very brittle, and it was with difficulty that I could amalgamate it with mercury. When I returned it, I had a conversation with him, the moral of which is that there are various kinds of palladium. I do not know whether you are ever required to use it, but if so, you must be careful to get the right kind.

A gentleman has just asked me if Sullivan's and Rogers's copper preparations are the same. Sullivan's was made in Germany many years ago. Rogers's was made in London within the last fifteen years. Sullivan's is exceedingly dirty and does not answer the purpose for me.

A Member.—You speak of softening the amalgam. What do you mean by that?

Dr. Bogue.—Heating it until it sweats mercury, and then working it in the hand or in the mortar, and then letting it harden, again heating it until the mercury sweats, then rubbing it in the mortar, and then squeezing all the mercury through a chamois-skin and again letting it harden. Do that three or four times, and then let it harden. The result is a product that is different from any we have.

Dr. Hart.—Did this copper amalgam that you speak of waste very much?

Dr. Bogue.—I do not know that it wastes very much. I have seen some twenty-one years old. It does waste slightly, but so little that it is hardly perceptible.

Dr. Watkins.—I dislike to disagree with my friend, Dr. Osmun, but I have had experience with copper amalgam to my sorrow. I used it a great deal at one time, and regard Russell's as finer and cleaner than any of the others. The amalgam will apparently appear to work well, and will seem to give perfect satisfaction. In a brief period the filling is bright but wasted, and in such cases it has been my experience that the tooth is exceedingly sensitive around and under that filling. I have had a different experience from some of the gentlemen, inasmuch as instead of finding the fillings soft, so they could be taken out with a spoon excavator, they seemed to me to be as hard as steel. It is difficult to make the

two things agree. I have come to one conclusion in regard to this amalgam, and that is, never to use it except in cases where we have very soft, white teeth, where the saliva is inclined to be acid. Take, for instance, teeth which are pearly white, and in which the decay is rapid. I have seen many where it has been in such mouths for several years, and doing beautifully, as black as ink, the lines perfect, no sign of decay. I met a case of that kind a few days ago, and I was pleased to see how beautifully the teeth were being saved; but I think such are exceedingly rare.

The subject to my mind is still in doubt. There are so many cases where fillings have been put in at the same time and apparently under the same conditions, where one will be good and the other will have left the cervical wall, so that an excavator can penetrate the material. Take two approximal cavities, where one filling will be good, black, and not deteriorated. Perhaps in the adjoining filling one part will be good and the other part wasting, and yet bright in color. It seems to me an experiment, and the safest thing is to let it entirely alone, with the exception of the few cases under the conditions which I mentioned.

Dr. Howe.—From a limited use of copper amalgam, I came to the conclusion that it was a very uncertain material, and I have not employed it for fully two years. I have had some success in making good permanent fillings, but very many more failures. Whatever antiseptic influence it has, it does not prevent decay from beginning and progressing directly in contact with it. I failed to find in it any constant qualities that were desirable, and when I became convinced that I could not make fillings that I could rely on, I abandoned its use.

Dr. Bogue.—Before Dr. Howe's remark has passed from memory, I want to speak of a little incident that has occurred to me. Most of us use pepper when we lay our clothing away in the spring-time, so the moths will not get at it. Not long since, I opened a box of Darby's capsicum pads, and found they were all moth-eaten, apropos of copper amalgam.

Dr. Francis.—I came here not to impart any information in regard to copper amalgam, but rather to learn something about it. When I first heard that such a filling was in use I was much prejudiced against it, believing it an improper material to put in the mouth, and it was a long time before I could persuade myself to try it. In the mean time I had heard and read much concerning it, also had repeated opportunities of seeing and examining fillings of this material in a number of mouths where it had been employed.

I noticed cavities filled with it where the walls were very frail and yet the teeth were not discolored in the least; the discoloration being confined to the exposed surfaces of the amalgam. I have, however, seen some teeth badly discolored by the filling; and other cases where the fillings assume a frosty white appearance and the teeth not discolored, yet looking somewhat worn. I must admit that copper amalgam has been a puzzle to me even to the present time.

I have heard much said of its preserving properties, and feel convinced that there are many cases where it has preserved cavities fully as well, if not better than anything else. I mean such cavities as are very difficult to fill with gold. I have not witnessed many failures, but have seen enough of them to make me hesitate before using it; and hardly know yet whether to recommend it or not. I think, however, that in particular cases, for instance on the buccal or even the approximal surfaces of the back teeth, it may be used advantageously. I have, in several instances, had occasion to remove copper amalgam fillings, but they were so hard as to render the operation difficult. I have seen cases where the fillings work perfectly smooth and the cavity margins well preserved. I have also noticed successes and failures in the same mouths. Whether or not these varied conditions are due to the manipulation or preparation of the amalgam, I do not know. In cases where fillings appear worn away, I have thought the filling had been overheated. Like others, I have used it with success, but with some failures. The same rule will apply to other stoppings.

Dr. Rich.—I have had no experience with copper amalgam, as I have never used it, and cannot, therefore, speak about it from the stand-point of personal experience. I have seen quite a number of fillings constructed of it that were not preserving the teeth, but as I did not know anything about the preparation of the cavity, or the amalgam, or how it was introduced into the cavity, I had no means of forming an intelligent judgment about it. The general impression in regard to it made upon my mind by those fillings I have examined would be against its use.

I am surprised to hear so many dentists say they have used it, and yet acknowledge that they knew almost nothing about its composition and preparation. Dr. Bogue's experience is that in his hands it is generally successful, that as he prepares and uses copper amalgam it will preserve the teeth, and he seems to know more about its composition and preparation than any other person who has spoken of it to-night. Others, who have given us their experience

with it, say that in their hands it is almost always a failure, but those who speak of it in this way do not seem to know much about its preparation or properties.

Dr. McQuillan.—At one time I used considerable copper amalgam, but for the last eighteen months I have not inserted one filling of it. While my successes have been greater than my failures, the failures have been very lamentable. I have had a success on one side of the mouth, and a failure on the other. I, therefore, came to the conclusion that it is too unreliable for me to use. I can get a better result on buccal surfaces with gutta-percha. I think my patients have swallowed enough copper amalgam to satisfy me, and I shall not use any more.

Dr. Perry.—I do not know much about copper amalgam. I do know it is very unreliable, and do not use it; and wish I never had, and the greatest mistake of my professional life was made when I did. I think, however, I should be partly excused for having taken it up. I am going to put in a plea for myself, as well as for the profession, because, if you think back for ten years, you will remember that there has been considerable said about it, coming partly from the other side, and said in such a way as to leave the impression upon the minds of the profession at large that it was a material which did not shrink. Of course, for many years we have been searching for just such a material. When some of us saw some fillings in different mouths that were looking well, and not having the appearance of shrinkage, I think we were all justified in concluding we had the material we wanted, and had something we could depend on. We had heard of its success, and had seen cases where it had succeeded; but not a word yet about the failures. In my own experience, the first series of cases I saw were very remarkable indeed. Dr. Darby sent a patient to me with a number of those fillings, and I think those were the first ones I had ever seen that I really knew were copper amalgam fillings. I was profoundly impressed with the appearance of these, and, never having any suspicion of danger of waste at the cervical margins, or mechanical wear on the surface, and having no hint of the unusual danger of discoloration in dead teeth, I was ready to commence its use. Dr. Rich, of course, is right in saying that we should not use anything of which we are ignorant; but we must do the best we can, and we felt that we did know something about this amalgam. The danger of discoloration we did not suspect, for I have no knowledge of any hint having been given in the literature on the subject; but this I found to my regret subsequently.

I have some black monuments standing in the mouths of patients, which I would give a great deal to efface. There is no hope of changing them, because it cannot be done. Copper amalgam does not affect the living tissue of living teeth, but it invariably discolors the bodies of dead teeth themselves. It seemed to be a great point to have something with which frail shells could be restored to usefulness. I felt that at last we had a material that would be of great value in the matter of restoring the shapes of the teeth, and thereby keeping the occlusion perfect. I suppose I am rather too enthusiastic; when I see what appears to be a good thing, I adopt it. In the early years of my practice I made a mistake in filing and separating the natural teeth. But I learned something by that experience, and I believe my patients have since profited by it. I must not be too sweeping and positive in the condemnation of copper amalgam, because it has a certain quality which some day may be made available. I must say I have seen a few cases where it has done well. Certain teeth with small fissures on the grinding surfaces can be benefited by it, and I think, in the teeth of children, it can be made available, because we do not expect long use in temporary teeth. It is soft and manageable, when nicely prepared, and easily applied. Some of our friends who have never used any amalgam at all have had much to say in reference to the effect of mercury. I do not know if I am quite right, but I think that applies more particularly to men who have homœopathic leanings. What will our homœopathic friends say to the question, What becomes of the mercury?

Dr. Ives.—I only inserted one copper amalgam filling in my life. I regret the broken instruments destroyed in removing the *débris*. I do not think that any class of teeth can be as well saved by good ordinary amalgam as by copper amalgam.

Dr. S. E. Davenport.—It is a satisfaction to me to know that gentlemen possessing the attainments of our essayist are devoting their attention to the study of this question, for I feel that there are qualities inherent in copper amalgam which are very useful, and if a way could be found to make them always available, we would have a most valuable material. My experience does not differ very much from that of the other gentlemen who have taken part in the discussion, and I do not think anything would be gained by referring to it in detail. I have recently had several opportunities of observing copper amalgam fillings in the mouths of patients of some of the best-known English dentists, and I think their proportion of successes is not greater than ours, for I found

but few of the fillings doing good service. I began to use copper amalgam about eight years ago, and for several years I used it for certain cavities in soft teeth with considerable satisfaction; but for the past two or three years I have used it but seldom. The amalgam which has been referred to by Dr. Bogue, prepared after the Rogers method, seemed at first to be almost universally reliable, but recently the quality has evidently deteriorated. I have had the pleasure of seeing in the mouths of some of Dr. Bogue's patients copper amalgam fillings, made probably fifteen years ago which were almost perfect, and certainly doing as well as any filling possibly could have done under the circumstances, for, of course, they were not used in a high class of tooth-substance. I think, however, if Dr. Bogue should go a little more fully into his personal experience in the matter, he would tell us that he does not use copper amalgam frequently now, and has less confidence in it than he had some years ago.

Dr. Bödecker.—I am sorry I was not here in time to hear the paper and the discussion by some of the members, but I briefly state some of the experience I have had with copper amalgam in the past few years, although I have seen a great deal of it during the time I was in England. The gentleman whom I was with had a great deal of faith in copper amalgam, and claimed to obtain better results with it than with any other he used. This amalgam we made ourselves. In this country I have not employed any in practice until four or five years ago. I commenced to use it when it became famous here, so to speak, and I very soon found that there were many failures on account of shrinkage and wasting. About three years ago Dr. Herbst, of Bremen, wrote me a letter about using amalgam, saying that he had very wonderful results if he added to it, before putting it into the tooth, a little fine silver-foil. I tried that, and it worked as described,—namely that the edges will stand beautifully, and there will almost be no wasting. At that time I made some experiments in glass tubes and filling them with carmine, but I never saw any of the fluid between the tube and the amalgam. I tried the same experiment with copper amalgam, and I was surprised at the success. The discoloration of the copper amalgam which we usually observe is almost entirely gone, and it gets very much harder and wears better. It is done in the following way: When the amalgam is heated very carefully and put into the mortar, a little mercury is added, and the amalgam crushed and rubbed thoroughly; then to about eight grains of copper amalgam I add one leaf of the

ordinary fine silver-foil which you obtain from any gold-beater. Then I put it into the tooth with the Herbst burnishers, and I must say I have not seen a failure around the edges, or much discoloration. Without the addition of silver to the copper amalgam I have seen more or less discoloration and wasting of the edges.

Dr. Rich.—May I ask Dr. Bödecker the weight of the silver-foil he used?

Dr. Bödecker.—I have no scales sufficiently delicate to weigh it. It is the fine silver leaf the gold-beaters make, which is used for silvering. It is not a quarter of a grain in weight. It dissolves instantly in the mercury.

The President.—We have received several communications from gentlemen who are not able to come to-night. The editor will oblige us by reading some of them.

Dr. Dwinelle.—Before the gentleman reads those papers, I will venture to volunteer a few remarks. I have had very much the same observations that others have expressed here to-night in regard to copper amalgam. I have been enabled to deduce certain conclusions, but I have not been an advocate of it, and have not used it to any great extent. I have employed other materials which have answered every purpose that I could wish for. I think one great cause of failure has been that these have not been properly prepared. I have a method of preparation by which I am assured of a very good degree of success, and that is, in washing my amalgam. Take the granulated amalgam,—that is, in grain form,—and if it has been on hand any length of time, it has become exceedingly oxidized, especially if it has been in the vicinity of sulphur. Old amalgam will waste to a considerable extent. I have had it waste to at least one-half its bulk. I wash it in carbonate of soda, and often wash away one-half of its substance in bulk; then I carefully prepare it and squeeze out the excess of mercury, and in that way have no trouble, especially in discoloration. I think that the old-fashioned amalgam is as good as any can be, copper amalgam not excepted. I can show fillings twenty-five or thirty-five, and perhaps forty-five years old.

Dr. Francis.—I never have felt sure of amalgam of any kind. I have employed it as others have. I am not even sure of gold fillings, because I have seen many crumble away.

Dr. Dwinelle.—In many cases of frail teeth, gold is perhaps the worst material to put in. I have filled frail wisdom-teeth many times to the best of my ability, and have failed every time, but when filled with amalgam, they succeeded, and they are there to-day.

On motion of Dr. Hart the written discussions were made part of the transactions.

W. D. Miller thinks it of great value, but its faults of wearing and washing out are serious.

J. N. Farrar believes that for preserving teeth it is equal, and in many cases superior, to any other amalgam. The great objection to its use is its color.

E. T. Darby: Does well on masticating surfaces. Not so well on proximate surfaces. The same material, worked in the same manner, will produce different results in the same mouth.

I. B. Davenport: When it turns and remains black, he concludes it to be the best material for saving deciduous and soft permanent teeth.

W. W. H. Thackston says he has not used it, but his observation of it is unfavorable.

W. H. Robbins formerly employed it freely, has since removed all,—some thousand fillings,—and does not use it now. Is sorry he did use it.

F. N. Seabury never used it.

J. L. Williams has considered it undesirable, and has been saved from much "experience" with it.

D. M. Clapp, from limited experience, finds numbers of failures out of all proportion to successes. As a rule, does not preserve from decay better than ordinary amalgam. Stains teeth badly.

C. A. Marvin has never used it.

C. S. Wardwell, from limited experience, finds it objectionable and has ceased using it.

E. J. Niles considers it undesirable, on account of its wasting.

R. R. Andrews considers it unreliable. Washes out.

H. B. Noble used it sparingly for two or three years. Found nothing to commend it over other amalgams.

Sir Edwin Saunders used it some years ago, when in practice "as a filling for buccal cavities for lower molar teeth, where it seemed to do well;" was apparently "free from shrinkage, but not hard enough for the attrition of mastication."

Geo. A. Maxfield has had favorable results from its use, but failures have occurred in a few mouths where the fillings hollowed out at centre, and in each case this has occurred in mouths when the teeth were free from salivary calculus; attributes many of the reported failures to the material being poorly made.

Louis Jack finds it has been of value in some cases, yet in many more, results have been so indifferent he felt compelled to

abandon its use. Results have differed greatly from causes which do not appear, although the material was the same apparently, and prepared in same manner. Suspects possibility of serious consequences following the imbibition of the wasting material. Has not found the material prevents the recurrence of caries.

C. V. DuBouchet believes the merits of copper amalgam due to its apparent non-shrinkage, capability of hardening tooth-structure, and possibly its germ-destroying properties.

H. C. Quimby has observed many teeth badly stained by its use; thinks that it may have a value, but its unsightly appearance has deterred him from using it; thinks other amalgams equally preservative.

J. S. Latimer used it about a year; its unsightly appearance and slow setting and its rapid wasting caused him to cease using it.

W. A. Potter says that its color is so objectionable that his use of it has been very limited.

C. P. Stockwell considers it "preferable, all things considered, to any other material, . . . in a very narrow field."

C. S. Stockton has "practically ceased the use of copper amalgam because of its uncertain results."

C. N. Peirce: From a limited experience, its use "has not been satisfactory, because of its frequent disintegration at cervical borders."

J. A. Woodward: Its use has been limited to small approximal cavities of bicuspid and molar teeth. It has failed to arrest decay as frequently as other amalgams that I have used for similar cavities.

V. C. Pond has used all the well-known makes, and does not find that they differ much; finds decay to recur about margins of fillings, a large proportion wasting, and many discoloring the tooth-substances.

Chas. T. Allan says that, for filling in first molars of very poor and soft structure, it is the best material we have. Regards it almost as highly for proximal and buccal cavities in molar teeth of adults when of very poor structure, and when used in these cases does not think the washing away of material will prove an important factor.

G. L. Parmele has had good results in some cases; on the other hand, has been disappointed, first, by failure to harden and washing away; secondly, by extension of caries; does not employ it as much as formerly.

JOHN I. HART, D.D.S.,
Editor New York Odontological Society.

ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.

The regular monthly meeting was held May 12, 1892. On the completion of the routine business the president introduced the essayist of the evening, Dr. Joseph Head, who read a paper entitled "Dental Litigation, Past and Present."

(For Dr. Head's paper, see page 510.)

DISCUSSION.

Dr. Boice.—I would like to refer to one article Dr. Head mentioned. The Cummings patent was not for making rubber hard or rubber in plates or any shape or form, but simply for attaching porcelain teeth by means of metal pins into the rubber. The old Goodyear patent was for making plates of hard rubber, but the remarks on the injustice of the patent are undoubtedly true.

The Protective Association is the first association, I think, that has ever been organized for one object,—the protection of dentists. When it was first organized I joined it. It is necessary that we should be banded together in one association, as we have had nothing heretofore in dentistry, and I think it the duty of every member to talk to his neighbor and ask him to join. I asked Dr. Crouse some time ago how Pennsylvania was doing in the Protective Association. His language in reply was more expressive than elegant. Although we were one of the last States to see the importance of this work, can we not in the near future be one of the first in this good cause?

Dr. Rehfuss.—I am not aware that there are any law-points involved in the paper. It is an excellent history of dental patent litigations, which should have been its title, as there are so many different kinds of litigation in dentistry.

The Dental Protective Association has done wonderful work in protecting us. None but one who has gone through the whole patent matter, and who has thoroughly investigated nearly every case that has occurred in dental litigation, can realize the immense number pertaining to the dental profession that have come forward, particularly of late years. The history of the Goodyear patents is well known to you all, and have been very vividly and explicitly brought out by Dr. Head.

The previous speaker was in error when he said the Goodyear patent was not for vulcanizing rubber. It was for the process or

composition, vulcanizing for *all purposes*. The Cummings patent was for the adaptation of vulcanized rubber to dental purposes. The reason for taking out the latter patent was, because the former, for the application of vulcanized rubber, would expire three or four years previous to that of the latter. Now we are threatened with a different class of dental patent litigations, and it seems to hinge entirely upon the bridge and crown patents. In the case of the International Tooth-Crown Company *vs.* Richmond, an entirely too broad construction was given by the judge, and it was erroneous, giving the patentee more than was claimed in the patent right. The patent gave him the right to cement bridges or continuous bands around the adjoining teeth, and thereby holding them in place permanently. The judge in this case gave it as his opinion that a crown was nothing more than a continuous band with a roof upon it, and allowed him a broad construction of his patent-claims, thereby making it illegal for any dentist to put in a bridge-piece which is fastened upon adjoining teeth by continuous bands or metal crowns.

The whole history of patent litigation has been a mistake throughout. A mistake in legal interpretations. The Dental Protective Association is doing a good work in proceeding against this, and in contesting these patents. As the majority of dental operation patents are worthless, I feel protected in doing any operation in dentistry, since I am a member of that Association. No man can afford the pecuniary means or time necessary to collect evidence in these cases or fight them single-handed. We must remember in our profession the old adage,—in union there is strength. Therefore I would call upon every member present who is not a member of the Association to join. There is but about one-fourth of the profession in that Association, and when we have the full number we can look forward to fighting not only unjust demands of patent agents, but other classes of abuses in dentistry of a legal nature.

(At this point Dr. Faught asked if it would not be well for those present not members of the Association to give their reasons for not being such. The answer in general was carelessness rather than a want of interest.)

Dr. Bassett.—This subject seems to admit of only a one-sided discussion, but I would like to narrate a little incident. I had the pleasure of joining this Association when I first heard of it, but the thing that influenced me was the experience of a classmate of mine. He had been practising in New York with some of these tooth-crown people, but finally separated from them and pursued

some of the methods that they already had in their operations, but the Tooth-Crown Company soon followed him, and he undertook to fight them by employing a lawyer. He spent several hundred dollars, all the money he could spare, and finally had to give up the case because his money gave out, and he then took out a license from the company and went on. He was one and they were many, so they won the battle. As soon as this Protective Association was formed it seemed to me a very good way of combining and protecting ourselves at a very slight expense.

Dr. Truman.—I suppose many in the profession are like some present,—they have deferred attending to it. Those who have been sufferers from the old Goodyear Rubber Company do not require any urging to go into the Dental Protective Association. The trouble, the annoyance, the spy system that we all experienced at that time is well remembered, and we would be precisely in that same condition to-day were it not for Dr. Crouse and his Association.

I regard this Dental Protective Association as something more than a mere protection in a legal sense. There is nothing so powerful as a selfish interest to bind men together. As I said recently in an editorial on this very subject, that it is an important move for the man who is isolated and is yet able to feel through it that he is in touch with every other man in the profession. I feel more and more every day the necessity for men to get away from their petty, narrow jealousies. Dentists are full of it. We are broader in this country I think, taken as a whole, than anywhere else in the world. Yet there is room for improvement.

I remember when I first commenced to practise in my father's office, if a dentist came in he was considered an intruder, with the supposed intention of acquiring information without paying for it, and consequently the bars were put up in every office. This association will not only protect us legally, but will bring us together as we have never been before.

I hope those who are not members of the Protective Association will join. I know at times pecuniary difficulties are in the way, but Dr. Crouse makes it as easy as possible by the note plan. As has been said, he has expended time and money. I don't know another man so self-sacrificing. It requires just such a one to take the lead and stir the profession to its duty.

Dr. Head.—I think probably it might be well to explain to any dentist who might send their notes to Dr. Crouse that he will give them protection from any suits which may be entered against them from the time he receives such notes, but that he cannot let them

egally join until the notes are paid. I know there has been a great leal of misunderstanding on that subject, many supposing that the notes meant that they were enrolled in the society, but Dr. Crouse s unable to do this for the reason that the money must be paid nto the treasury absolutely before such enrolment can take place. To do that he would have to advance money himself, and, of course, where so many notes have been sent to him he cannot afford to do t.

Dr. Boice thought it appropriate that the Society should join as an individual to encourage the Association. A number of organizations have adopted this course.

Motion to that effect was made and carried.

Dr. Truman, under "Incidents of Practice," introduced a patient of Dr. Peeso with a full set of crown- and bridge-work which he thought worthy of examination.

Adjourned.

AMERICAN ACADEMY OF DENTAL SCIENCE.

The regular monthly meeting of the American Academy of Dental Science was held in the Boston Medical Library Association rooms on February 3, 1892, President Brackett in the chair.

The paper of the evening was read by Thomas Stellwagen, M.D., D.D.S., of Philadelphia; subject, "The Teeth and the Feet."

(For Dr. Stellwagen's paper, see page 502.)

DISCUSSION.

Dr. Stellwagen.—In examination of patients at Orthopædic Hospitals, in nearly every case where the dental irregularity was slight or entirely absent the children had, to a great extent, supplemented by their hands the use of their feet, and thus their mouths were kept in a tolerably healthful condition.

A study of a series of heads showing the development of the teeth demonstrates that at the age of the eruption of the permanent teeth the jaws increase very materially. Hence at this period it is of the utmost importance that the maxillæ should be exercised.

In the list of cases examined there were twenty-four boys and twenty-two girls. Among the boys there were fifteen irregular cases requiring operation for regulating the teeth, some of these

also requiring an expansion of the jaw. Of the very irregular cases, there were seven requiring operations both to straighten the teeth and to expand the arch. In twenty-two cases of girls, eight normal cases were found. Six were slightly irregular, eight decidedly irregular.

The cases examined were nearly all in hospitals, and the average age eleven or twelve years.

Dr. Williams.—A long time ago the remark was made in one of our best books, "Let not the hand say unto the foot, I have no need of thee," and although that is not the title of Professor Stellwagen's paper, his application of that idea is founded on solid principles.

Another point, too, that struck me in his address was the fact that a corn on the toes or a pinching boot will take away one's appetite, and I can see how, if the irritation exists sufficiently long, a discomfort of this kind would create malnutrition, and its consequent effects would be apt to show themselves quite as much in the teeth as in any other part of the body.

Dr. Eames.—This paper is a strong argument that the dentist be medically educated, in order to better understand the significance of the relations existing between different parts of the body.

From the better medical education of the dentist may come important light upon the subjects of erosion, phagedenic pericementitis, and stomatitis.

Dr. Barker.—Professor Stellwagen's paper is a new statement of the old fact that function determines form. The moral contained in the paper might well be applied to many of our school-children, whose time is so largely occupied in the translation of Latin and the study of Greek roots that they neglect physical development. Parents who have young children should turn them out to pasture, treat them like colts.

Dr. Stellwagen.—My opinion is that the foot should be covered with something more like a moccasin than a shoe, and that children should be allowed to run barefooted as much as possible.

The benefits derived from this practice were demonstrated last summer during a six weeks' sojourn at the sea-shore. Two of our youngest children were allowed to walk and run in the sand without shoes or stockings. The result was that the boy, who is now thirteen, increased in chest girth from sixty to seventy centimetres, with the power of expanding the chest to eighty; so that he really increased his measurement from one-sixth to one-third.

His limbs also were materially changed, the muscles were firmer

and more solid, and his foot increased about a size and a half. Would it not be better for children if barefooted exercise were substituted for the use of donkeys and many other means of amusement? Would we not have a better development and a firmer condition of the teeth and jaws as well as of all other parts of the body.

WILLIAM H. POTTER, D.M.D.,
Editor American Academy of Dental Science.

Editorial.

HONORARY DEGREES.

IN the earlier period of dental education, when the degree of Doctor of Dental Surgery was in its infancy, and its value was as yet an unsolved problem, the title was not only freely given, but it became an important unifying measure in the consolidation of professional interests.

The dental profession was confronted, at the organization of the earlier dental colleges, with a large body of men who had received their dental training from private dental offices and laboratories. This dead weight in opposition to progress was not only felt, but, in time, became obstructive, by its antagonistic position to all college work. The problem was one difficult of solution. To give these men all honorary degrees was out of the question; to confer a degree by examination was equally impossible, yet it was evident that dentistry could make but slow progress while this incubus remained.

One of the older colleges assumed the position that the latter course was the only creditable way out of the difficulty, and commenced the examination of men who had had fifteen years of actual practice. This was continued for some time, but the plan did not meet with approval of other schools, or generally in the profession, and was finally abandoned.

The issuing of spurious diplomas, and their extensive circulation throughout the world, brought, as is well known, all degrees of an honorary character into such disrepute that the majority of the colleges voluntarily refused to confer it, and the question was practically relegated to the slow changes which time would naturally effect.

The organization of the National Association of Dental Faculties very speedily brought this and related questions to an issue. It was clearly evident that this body would not favor degrees of the character described, and the matter was finally settled by a decisive vote refusing to allow a college to grant it upon one of the most distinguished of the older class of dentists. It was subsequently made impossible for any school associated with this organization to confer it. This action was universally accepted, not only as the proper course, but the only one possible for a dignified profession to pursue. Since that period the degree has ceased to appear at commencements.

It is with much regret, therefore, that we notice that this form of diploma has been revived in a neighboring State upon the organization of a new college, two gentlemen having received it, in order, it is presumed, to render them eligible to fill two of the chairs of the proposed institution. With their fitness for these positions we have nothing to do, but with the principle involved the whole profession is interested. The time is past for such a degree to be necessary. The training of men in the theoretical and practical branches has advanced so steadily with the lapse of years, that there should be no need to recur to an obsolete practice to secure the required ability to serve upon the staff of teachers.

Whatever may have been the value of this honorary title in the past, it has none now; indeed, it may be said to be an injury to the person possessing such a diploma; certainly it adds nothing to his position among his colleagues. The latter are more willing to accept an honest and intelligent evidence of correct practice than any sham presentation of ability however elegantly it may be inscribed.

The abuses of unearned degrees have multiplied to such an extent that it is the duty of all who value the good name of dentistry to set their faces in opposition to all attempts to return to a condition which had only expediency as an excuse for its adoption.

The degrees conferred were, doubtless, given under a wrong impression of the status of affairs, and with an idea of adopting a speedy way out of an embarrassing difficulty. Whatever may have been the motive, and we are not inclined to harshly judge it, the effect cannot be confined to a local area, but must have a widely-extended influence. If it will bring forcibly to the minds of all connected with educational matters that this degree can have no place in any well-regulated school; it will have a value not anticipated, probably, by those who conferred it.

It is gratifying to notice, as an indication of a healthful feeling,

that the course of this university has provoked an extended comment of opposition. This has not arisen from any antagonism to a new school, but from a sincere conviction that a serious mistake has been made. It is to be hoped that it is not too late to correct it, for, in retracing the steps taken, the authorities of the university will show, in the best manner possible, that they have a respect for professional opinion, and have also a due regard for the future reputation of their new department.

The following quotations, taken from an article by a distinguished educator in dentistry, cover the whole ground, and should be seriously considered by those at the head of the new institution.

"The graduates of fifteen years ago would now scarcely recognize their Alma Mater. The granting of honorary degrees has been practically abolished. No college can confer a diploma except in course without first obtaining the consent of all the other schools in the association. Students must be in actual, daily, faithful attendance upon college lectures during the whole term of pupilage, or they are debarred from coming up for graduation. . . .

"This responsibility of each college to all the rest covers not only its manner of teaching, and of granting diplomas, but its discipline and internal regulation as well. At the last meeting of the Associated Faculties, one school was suspended from membership for a period of two years, because it had conferred a diploma upon a student who had not been faithful in a full attendance upon college lectures.[1] The suspension is a serious matter, for it means that no college will receive a student from it, or dismiss one to it, nor will its diploma be recognized in any manner. . . . A diploma should be a certificate of study, and it is a fraud when it represents anything else. . . . The whole system of conferring diplomas as marks of honor is wrong. . . . A college diploma is a certificate of study, or ought to be."

These views tersely expressed will certainly meet a sympathetic chord in every one opposed to any movement that implies retrogression, or an attempt to revive the practices of a dead past.

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[1] This is not absolutely correct. The college in question matriculated two students long after the time limit.—Ed.

THE CONVENTIONS.

THE period of the year has nearly arrived when many dentists, throwing off the shackles of daily labor, devote a portion of their summer leisure to the advancement of their profession. The number, we regret to be forced to state, is not a large one, but every year marks a notable increase and an improvement in the character of the gatherings. This is to be expected.

The necessity for a more active interest in these meetings was never more apparent than now. Dentistry needs the help of every man connected with it, and each who has been benefited by it—and who has not?—is in duty bound to aid either in his local, State, or national organizations. It is feared that many remain away from these meetings under the impression that because they are not writers of papers or equal to taking part in discussions, they are of no use. This is a serious error. The mere presence of an individual is an inspiration, and becomes a power for good in the enthusiasm created by numbers. Too many, we fear, prefer the luxury of a rest by the sea or the mountains, under the, to us, mistaken idea that the profession will be taken care of by others. This is the selfish view of the matter, which means, generally indulged in, the relapsing of the entire body into a stage of decrepitude.

The social life of these meetings is of untold value. The yearly coming together of men from distant sections and the interchange of thought for a few days means new life in the sections they represent and an invigoration of the entire organization.

The American Dental Association meets this year at Niagara Falls, August 2. At this pleasant and convenient locality we anticipate a large gathering. At the same place, August 1, the National Board of Dental Examiners and the National Association of Dental Faculties will assemble. Matters of vital importance will claim the attention of all these bodies.

The Southern Dental Association will meet at Lookout Mountain, Chattanooga, Tenn., July 26, to which numbers from the North will be attracted, as the meetings of this organization are always full of interest.

The meeting of the American Dental Society of Europe will be held this year at Basel, Switzerland, August 1, 2, and 3, and should draw every American operator and those in sympathy with them throughout Europe to this annual gathering. Those who contemplate visiting the continent should arrange to be in Switzerland at that time. We can assure them in advance a cordial

welcome. This body of earnest workers has been organized amidst many and unusual difficulties, but it has been carried along year by year until it has become a moving force in the profession everywhere.

The various State organizations will claim special interest, and will, from present indications, be well attended.

Whatever may be the changes in these annual convocations in the future, and these may not only be possible but necessary, there is but one course to take in the present,—give undivided support to those already existing.

THE WILCOX BILL.

Especial attention is called to the statement issued by the Maryland State Dental Society upon this bill, which has recently passed the House of Representatives.

The interest taken in this matter by the dentists of Maryland is not only worthy of unstinted praise, but they should receive the cordial and immediate support of the profession throughout the country. This must be given at once if anything is to be accomplished. Let each one make it his special business to write to the senators of his State. Flood them with letters and petitions, and in this way create a sentiment of opposition.

While statistics of mechanical work connected with dentistry would unquestionably be of great value, provided they were correct, the means adopted by the Census Bureau have been of such a character that self-respecting dentists have, in many instances, refused to answer. This bill makes this imperative, and virtually places dentists outside the pale of the professions. Are the dentists of the country willing to permit this bill to become a law, without an effort to defeat it? The answer to this must be in immediate work.

DR. JOSEF ARKÖVY.

Upon the nomination of Count Csaky, Minister of Instruction of Austria, the Emperor has appointed Dr. Josef Arkövy to be Professor of Dental Science in the University of Budapest.

This appointment is one most worthily bestowed. Dr. Arkövy has occupied a prominent position as author, teacher, and clinical instructor. His work on "Diagnosis of Dental Diseases" is one of the most thorough in dental literature, and its publication raised him at once to a first rank in his profession in Hungary and the world.

Bibliography.

A Treatise on Dental Jurisprudence for Dentists and Lawyers By William F. Rehfuss, D.D.S. Published by the Wilmington Dental Manufacturing Company. Philadelphia, 1892.

It may seem not only novel but somewhat out of place for a member of one profession to enter the domain of another and undertake a work of this character, and it may be doubted, if the case were reversed, whether a dentist would give a work on dentistry prepared by a lawyer, a place in his library or even consider it worthy of notice. Yet it is not impossible for a lawyer to be theoretically an excellent dentist or even have a very thorough idea of general medicine, as both dentists and medical men have found to their chagrin, when called upon the witness stand. It is not unusual for one trained in the special work of one profession to have tastes which lead to study in the work of another. Ministers become lawyers and lawyers ministers, and both may become doctors of medicine. Examples are numerous of all these various changes.

The writer of the present volume has shown, through his persistent work of years, in compiling this volume of 468 pages, that though an excellent dentist, his legal tastes have led him into a train of work, giving valuable results to his profession.

The idea will, doubtless, be generally entertained that, possibly this book may not be prepared as a lawyer would arrange it, or that it may be so defective in legal statement as to be practically valueless as a book of reference. This has been anticipated by the author, who has taken the precaution to have it revised by a well-known lawyer of Philadelphia, whose endorsement gives it all the professional strength required, and disarms criticism in this direction. He says, "I have examined the manuscript of your 'Dental Jurisprudence,' and find the general legal principles therein enunciated correct, while the arguments presented in the special subjects are in accordance with the authorized legal views. I can state that there are many facts in it which cannot fail to be of service to the advocate in the trial of a case, involving any part of the ground it covers.

"In the absence of any work on that particular subject, and especially from its intrinsic merit, your book is bound to become a reference in all cases of that kind."

The author explains his reasons for attempting this work in the preface, as follows: "Owing to the wonderful advancement within late years of the dental sciences, embracing the discovery of many new operations and methods of treatment, increased responsbilities are accredited to the dental surgeon, the neglect of which might involve him in litigation, and the knowledge thereof may at some period in his professional career avoid a calamity of a serious nature.

"For this reason a knowledge of dental jurisprudence would be of infinite value to the young graduate who too frequently enters upon his professional duties utterly ignorant and oblivious of the legal responsibilities incident to the practice of his profession."

The contents cover all possibilities that are likely to occur in practice, and become, therefore, of inestimable value to the beginner. The possibility of a suit at law for malpractice is a constant and increasing source of anxiety through all periods of the active life of a professional man, whether in dentistry or medicine. The very incorrect ideas entertained in regard to these various responsibilities has been often manifested in conventions whenever the matter has come up for discussion, and the writer has repeatedly heard it gravely stated that a graduate in dentistry was more liable to prosecution than the medically-educated man.

While there has been much written on medical jurisprudence, the question of the legal standing of the dentist has been almost entirely neglected, and with the exception of the able article on "Dental Jurisprudence," by Hon. Charles G. Garrison, in the "American System of Dentistry," there is nothing of special value. Hence, a book of this character is a timely production, coming as it does, at a period when the various States have enacted laws governing dental professional work.

The author divides his book under forty-two heads, among which may be found "The Legal Protection afforded the Dentist by the Degree of D.D.S." "Malpractice: What constitutes Dental Malpractice?" "Responsibilities of Dentists for one Error of Judgment." "Injuries and Deaths due to Anæsthesia, Compensations, etc."

A very full appendix is added, giving the laws of the several States and foreign countries. This is by no means the least valuable portion; indeed, it may be said to be very important, fulfilling, as it does, a want felt by all persons who have had occasion to refer to these enactments. The attempt has previously been made to bring these into an orderly, connected form, with only partial success. We have them here arranged for easy reference, and the collection

will undoubtedly prove of great value to members of State boards, heads of colleges, newly-graduated students, and members of the legal profession.

While the compilation, as a whole, is made interesting by the citation of cases, the dentist will, perhaps, turn to pages which deal with his daily work and the legal possibilities connected therewith; and to show the mode of treatment of a subject, we give abstracts from that on "The Fracture of the Jaws."

"To uphold this charge it devolves upon the plaintiff to establish, to the satisfaction of the court, that such injury in reality exists, either by the affidavit or testimony of the physician called to treat the injury complained of, or it may involve the actual exhibition or examination of the injury in court. The plaintiff must also prove that the injury was received at the hands of the defendant unless it is admitted by the latter that he was the direct or indirect cause thereof.

"The next step in the proceedings is to demonstrate that the injury was due to malpractice, and to show the nature thereof; whether ignorant, due to want of skill, wilful or negligent malpractice, from carelessness in performing the operation."

The subject is then continued and considered in detail.

Under the head of "Authority and Legality of State Boards," the following quotation is not without interest. It is taken from a paper published by Judge McGary, of Washington, entitled, "Are Medical Laws Constitutional?" "The State may doubtless create a Board of Health or a similar body, and require every physician to register his license with the board, or in the office of the county clerk or other appropriate place. But his rights to practise will not depend upon his registration, as the right has been already vested and assured by the diploma of the college. And should the State also vest the Board of Health with the right and even the duty of examining and licensing applicants, it could not apply to those who held a license from the incorporated colleges. Nor could it militate against or invalidate in any way the right of the colleges to issue valid diplomas and licenses before or after; for not even can the State, by its legislation, divest or impair a vested right which the colleges already had."

The question of "Patent Rights" occupies, as it naturally would, considerable space, and very clearly states the law in the question, together with a detailed account of the many prominent cases that have disturbed the dental profession in the past and are a source of anxiety in the present.

Perhaps that portion of the book already alluded to, "Dental aws in Foreign Countries," will be found most acceptable to a cer- ain class of inquirers. The difficulty of acquiring exact informa- on in regard to these has been a source of much embarrassment o deans of colleges, as they, more than others, are obliged to keep nemselves informed in regard thereto; but the difficulties in arriving t this information have heretofore been almost insurmountable. 'he author has, therefore, performed a most excellent service in dding this part to his work. It covers the laws of Austria, Hun- ary, Belgium, Brazil, Cuba, Denmark, France, Germany, Great Britain, New Zealand, Dominion of Canada and Provinces, Holland, taly, Russia, and Spain.

While the critical lawyer may find some things to take exception o, the non-legal mind will, we think, regard the work as most sat- sfactory. The careful reading of its well-prepared pages will un- uestionably be of value to many who have failed to consider the erious side of professional work.

The author is to be congratulated that in this new field of labor e has been able to add something of positive value to the needs of is profession.

The book is produced with excellent taste, and the publishers— he Wilmington Dental Manufacturing Company—deserve more an ordinary credit for their courage in assuming a business re- ponsibility which other firms had previously declined. The den- al profession should show by the demand for the book that their onclusions were not misplaced, and aid in giving it the widest rculation.

Obituary.

DR. DANIEL DWYER.

At the Twenty-eighth Annual Meeting of the Connecticut ate Dental Association, the committee appointed to express the ntiments of the organization as regards the death of Dr. Daniel wyer reported as follows:

Whereas, This Society mourns the death of Daniel Dwyer, D.D.S., who d in Hartford, November 7, 1891.

Dr. Dwyer was one of the original members of this Society. He began the

study of dentistry at an early age with Drs. Preston and McManus and with Dr. Crofoot, and was later for many years associated with Dr. J. M. Riggs. After years of active practice, he attended and graduated at the Baltimore Dental College.

Dr. Dwyer was a hard-working, conscientious dentist, and a warm-hearted, honest man.

Resolved, That the secretary be requested to place these resolutions on the records of the Society, and send a copy to his brother.

JAMES MCMANUS.
WILLIAM H. RIDER.
JOSEPH H. SMITH.

DR. JOHN ALLEN.

AT the Twenty-fourth Annual Meeting of the Dental Society o the State of New York, held May 11 and 12, 1892, the following resolution was unanimously adopted:

WHEREAS, This Society has lost in the death of Dr. John Allen, of Ne York, one of its oldest and most worthy members, one who for nearly three score years stood shoulder to shoulder with representative men in every laud able effort to promote the best interests of the dental profession, and who wa recognized as the author of the highest art in one of our most importan specialties; therefore,

Resolved, That this Society deeply mourns his loss and desires to extend t his family its truest sympathy.

(Signed) L. S. STRAW,
F. T. VAN WOERT,
O. E. HILL,
Committee.

PROFESSOR CARL SAUER.

THE death of Professor Sauer, on March 17, 1892, at Berli will leave a blank in dental circles in Germany not easily fille His work has been unceasing for many years, indeed he may l regarded almost as the father of modern dental thought a practice in that country.

For several years he was honored with the presidency of t Central Association of German Dentists. His recognized ability a metallurgist, and in general mechanical dentistry, led to his sele tion by the government for a professorship in the Institute of De tistry of the University of Berlin. This position he held up to t period of his death.

His name has long been a familiar one on this side of the A

lantic, and there will be many who will read of his death with feeling and sympathy for those immediately affected by his loss. The world has been made richer by his life, and in his departure he leaves dentistry in his own land advanced to a position which could not have been anticipated twenty years ago. For this success Professor Carl Sauer should be accredited a large share of honor.

Current News.

THE WILCOX BILL.

TO THE SENATORS AND REPRESENTATIVES OF MARYLAND, AND OTHER STATES, IN CONGRESS ASSEMBLED.

GENTLEMEN,—At the last Annual Meeting of the Maryland State Dental Society, held in Baltimore, on May 9 and 10, the following resolution was unanimously adopted:

"WHEREAS, A bill has been introduced in Congress, which provides that any person who shall neglect or refuse to give information to census officers shall be subject to a fine, 'not exceeding ten thousand dollars, to which may be added imprisonment for a period not exceeding one year,' and WHEREAS, the public press reports that the bill referred to 'will be used in the nature of thumbscrews and spiked boots to enforce replies,' and further, that 'the dentists of Baltimore, who by their refusal to answer certain questions . . . will be the first victims of the inquisitorial machine if the bill is passed;' therefore, be it

"*Resolved*, That this Association reaffirms the resolution unanimously passed November, 1890, protesting against the action of the Census Bureau, in classifying dentists as manufacturers and refusing to fill out blanks.

"*Resolved, further*, That the chairmen of the several standing committees, as now constituted, be appointed to convey the sentiments of this Association to the Senators and Representatives of Maryland in Congress, and urge them to have the bill referred to amended, so as to omit dentistry, in all its branches, from the tabulations of the census."

We, therefore, the undersigned, the committee appointed in accordance with this resolution, respectfully submit the following to your consideration:

1. Dentistry is recognized as a profession by law. Dentists are not required to serve on juries; they have been recognized as professional men,—to wit, in the case of Noble, before Judge McArthur,

of Washington city. The dentists of Baltimore have always been excused from jury duty.

2. Nearly all States of the Union have passed laws recognizing them as professional men, and in some of the States license fees are demanded from both physicians and dentists for the privilege of practising, and both are equally amenable to the law of malpractice.

3. Most of the States have appointed examining boards, to test the fitness of candidates for practice; similar laws are made bearing on the medical profession.

4. Maryland, Pennsylvania, New York, Massachusetts, Michigan, Minnesota, Kansas, Iowa, Illinois, Indiana, Missouri, Tennessee, Georgia, and Louisiana, have, through their respective Legislatures, granted charters to dental colleges, giving them authority to educate students in dentistry, and to confer upon those properly qualified the professional degree of Doctor of Dental Surgery.

5. In the National University's dental department in the city of Washington, D. C., the diplomas are signed by the President of the United States. This we think originated with General Grant.

6. Almost all the great Universities, including those of the city of Washington, have added dental departments, and are granting professional degrees by the authority of the United States government.

7. The American Medical Association has recognized dentists as specialists in medicine, and the International Medical Congress of the whole civilized world has done the same.

8. Dentists have given to the world the first anæsthetics, both nitrous oxide gas and ether, which Dr. Oliver Wendell Holmes has declared "the greatest boon ever given for humanity." They have also furnished the first splint really satisfactory in the treatment of fractured jaws. This splint was applied in the case of the Hon. W. H. Howard, with entirely satisfactory results, and this after the medical profession had utterly failed to reduce the fracture.

9. Both general and oral surgery are impossible without mechanics, and all operations both in general and oral surgery are more or less mechanical.

10. In the past, both surgery and dentistry were classed among the trades; but time, progress, cultivation, and advancement have altered the condition of things, and to-day surgery has its place on the top round of the medical ladder.

11. The manufacturer makes out of certain materials a new product and offers it on the market for general and indiscriminate use, as for instance the brick-maker.

12. Dentists are not, in the ordinary acceptation of the term, ither mechanics or manufacturers, any more than the general sur- eon. He applies his manufacture, such as improvising splint or essary, as the case may require, altering his product as the neces- ity of the case may demand, and does this through his professional nowledge of anatomy, etc., aided by manipulative ability and me- hanical skill. The dentist does precisely the same thing. The culist adjusts and fits artificial eyes by fitting and grinding as the entist does artificial teeth.

13. Artificial sets of teeth cannot be offered for sale, giving each ustomer an opportunity to select what he likes, for no set of teeth ould fit, or ever be fitted, for any but the one individual for whom t was especially made; therefore, no one can select a set of teeth s he might a hatchet or hand-saw or any other manufactured rticle in market.

14. Dental manufacturers are never classed by business men vith dentists; we are a separate and distinct body of men.

15. The Census Report of 1880 declares, "That persons following ndividual pursuits shall be classed together," and we find in that eport, headed "persons engaged in selected occupations," lawyers, hysicians, dentists, druggists, preachers, etc., classed together. That n the census of 1880 the precedent is established; and as a matter f fact, under instructions from the Superintendent of the Census, eneral Francis A. Walker, the reports which dentists made in the ity of New York were returned to them, and no further attempt vas made to classify them as manufacturers, and we respectfully efer you to the correspondence between Dr. Thomas E. Gunning, f New York, and General Walker at that time.

16. The druggist from manufactured ingredients makes a new roduct to relieve suffering humanity. The dentist does the same hing.

17. We would call your attention to the fact that all the material sed by dentists have, or should have, been classed under the head f "dental manufactures." This is true of gold and other metals sed in dental practice as well as of instruments, artificial teeth, ubber, etc.; there is no exception to this.

18. Many dental associations have forcibly expressed their nse of the great wrong done to the dental profession by being assed with manufacturers, when no other specialty of medicine is treated.

We would appeal to your sense of fairness. We claim to be a spectable and law-abiding profession, and ask justice at your hands.

For more than fifty-one years we have worked steadily and faithfully to gain our position and standing. This effort dates from the founding of the first college of dental surgery in the city of Baltimore.

We trust you will see the injustice of deposing us from our honorably-acquired position as professional men, and relegating us to our starting-point. We appeal to you, as officers of this great country to save us from this great wrong, which will undo the work of half a century.

You can readily replace us to where we were in the census of 1880, in the list of "persons engaged in selected occupations." At this time all dental colleges in the United States are raising the standard of culture, and have increased the time required for preparation for graduation from two to three years.

A rigid examination has to be passed in anatomy, physiology, pathology, histology, therapeutics, materia medica, chemistry, and oral surgery before the degree of Doctor of Dental Surgery is conferred. Is any such requirement made of any manufacturer?

Leaving this statement in your hands, we feel confident that, when fully informed of the facts of the case, you will in your wisdom do justice to our profession.

Very respectfully,

Ed. Nelson, D.D.S.,
R. B. Winder, Sr., M.D., D.D.S.,
T. S. Waters, D.D.S.,
A. J. Volck, Ph.D., D.D.S.,
Wm. A. Mills, D.D.S.,
David Genese, D.D.S.,
W. S. Twilley, D.D.S.,
Committee.

[In connection with the foregoing, the following circular has been sent us for publication.—Ed.]

Dear Doctor,—The Wilcox bill, making a fine of ten thousand dollars upon any one refusing to answer the questions of the Census Bureau, was passed in the House of Representatives on Saturday, June 4, and will come before the Senate soon. In the census of 1890 the dentists were classed with manufacturers, and as such were presented with similar blanks to fill, which was objected to by the profession generally.

It is the purpose of the several committees appointed by the different State and local societies to proceed to Washington and

protest against such classification. The undersigned request the President of each society, in his official capacity, and every individual dentist in the State, to write to Hon. Eugene Hale, the chairman of the Committee on Census Matters, protesting against the position in which the census authorities have placed our profession, and asking that we be excluded from the obligations and penalties of the Wilcox bill.

If you will kindly address a letter to Hon. Eugene Hale, United States Senate, Washington, D. C., we will be obliged.

Very truly yours,

J. D. THOMAS,
L. ASHLEY FAUGHT,
A. W. DEANE,
Committee.

[The following is the bill introduced by Hon. Mr. Wilcox. It was referred to the Select Committee on Eleventh Census, March 29, 1892, and reported, with amendments, April 23, and finally passed the House of Representatives, June 4, 1892.—ED.]

A BILL

AMENDATORY OF AN ACT ENTITLED "AN ACT TO PROVIDE FOR THE TAKING OF THE ELEVENTH CENSUS."

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That sections fifteen and seventeen of the act entitled "An Act to provide for taking the Eleventh and subsequent censuses," approved March first, eighteen hundred and eighty-nine, be, and the same are, hereby amended so that the Superintendent of Census shall be required to obtain from every incorporated and unincorporated company, firm, ASSOCIATION, *or persons engaged in any productive industry*, the information called for and specified in the general and special schedules heretofore approved *or to be hereafter approved by the Secretary of the Interior*. And every president, treasurer, secretary, agent, director, or other officer of every corporation engaged in such productive industry, and every person, firm, manager, or agent of unincorporated companies, and members of firms, ASSOCIATIONS, *or individuals likewise engaged in such productive industry*, from which or whom answers to any of the inquiries contained in the said schedules are herein required, who shall, if thereto requested by the Superintendent of Census, supervisor, enumerator, or special agent, or each or any of them, wilfully neglect or refuse to give true and complete answers to any

inquiry or inquiries contained in the said schedules, or shall wilfully give false information in respect thereto, shall be deemed guilty of a misdemeanor, and on conviction thereof shall be fined in a sum not exceeding ten thousand dollars, to which may be added imprisonment for a period not exceeding one year. And all acts or parts of acts in conflict herewith are hereby repealed.

MEETING OF THE PENNSYLVANIA STATE DENTAL SOCIETY AND THE JOINT MEETING OF THE PENNSYLVANIA AND THE NEW JERSEY STATE DENTAL SOCIETIES.

THE business meeting of the Pennsylvania State Dental Society occurs on Wednesday, July 20, at 10 o'clock A.M., at Cresson, Pa. Those attending should leave Philadelphia not later than the 11.20 P.M. train of Tuesday.

The joint meeting of the two Societies will commence on Thursday, July 21, at 10 A.M., beginning with the addresses of the presidents of each Society, followed by four papers, to each of which two formal replies will be read.

A varied programme of papers, clinics, and a clinical conference is provided for, all of which make promise of an interesting meeting.

H. NEWTON YOUNG,
Corresponding Secretary Penna. State Society.

AMERICAN DENTAL ASSOCIATION.

THE Thirty-second Annual Session of the American Dental Association will be held at Niagara Falls, New York, commencing at 10 o'clock A.M., Tuesday, August 2, 1892.

GEO. H. CUSHING,
Recording Secretary.

NEW JERSEY EXAMINATIONS.

THE next meeting of the New Jersey State Board of Examiners will be held at the Commission Rooms, No. 88 Broad Street, Elizabeth, N. J., on Monday and Tuesday, July 18 and 19. Candidates

will please file their applications with the secretary before July 5. Blanks and information furnished on application.

G. CARLETON BROWN,
Secretary.

88 BROAD STREET, ELIZABETH, N. J.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

THE Ninth Annual Session of the National Association of Dental Faculties will be held at Niagara Falls, commencing Monday, August 1, 1892, at 10 o'clock A.M.

Colleges making application for membership must send the same to Dr. J. Taft, sixty days before the time of meeting.

J. D. PATTERSON,
Secretary.

MAY 20, 1892.

FIRST DISTRICT DENTAL SOCIETY, STATE OF NEW YORK.

AT the Annual Meeting of the First District Dental Society of the State of New York, held April 12, 1892, the officers elected for the ensuing year were as follows:

President, William Carr; Vice-President, John I. Hart; Secretary, Benj. C. Nash; Treasurer, Kasson C. Gibson; Librarian, J. Bond Littig. Delegates to the Dental Society of the State of New York, for four years, J. W. Taylor and William C. Deane; for one year, Henry J. Hull.

Standing Committees appointed by the President: Executive Committee, A. L. Northrop, Delos Palmer, and William Wallace Walker, chairman. Clinic Committee, John H. Meyer, Henry J. Hull, and C. F. W. Bödecker, chairman.

B. C. NASH,
Secretary.

MINNESOTA STATE DENTAL ASSOCIATION.

THE Minnesota State Dental Association will hold its annual meeting July 13, 14, and 15, at Minneapolis.

L. D. LEONARD,
Secretary.

251 NICOLLET AVENUE, MINNEAPOLIS, MINN.

SOUTH CAROLINA STATE DENTAL ASSOCIATION

The Twenty-second Annual Meeting of the South Carolina State Dental Association, and of the State Board of Dental Examiners, will be held at Rock Hill, S. C., commencing on Tuesday, July 12, 1892, at 10 o'clock A.M.

Officers: President, J. T. Calvert; First Vice-President, C. S. Patrick; Second Vice-President, Theo. Johnston; Corresponding Secretary, A. T. Peete; Recording Secretary, B. Rutledge; Treasurer, G. W. Dick.

PATENTS.

A list of recent patents, reported specially for the International Dental Journal.

472,344. Metal Tooth-Crown. George Evans, New York, N. Y. Filed September 7, 1891.

Trade Mark. 20,929. Aluminum Solder for dental Plates and other uses. Charles Gerard and Joseph S. Letord, Kansas City, Mo. Filed March 1, 1892.

472,683. Coupling for dental engine shafts and hand-pieces. Johannes Th. Pedersen, New York, N. Y., assignor to William E. Wells, same place. Filed August 25, 1891.

472,686. Dental Mallet. William E. Wells, New York, N. Y. Filed August 24, 1891.

472,776. Dental Engine. Wallace W. Williamson, Syracuse, N. Y. Filed May 28, 1891.

473,040. Teeth Regulator. Deel R. Wilder, Los Angeles, Cal. Filed February 2, 1892.

474,011. Dental Tool. Almer M. Harrison, Columbus, Ohio Filed August 28, 1891.

474,104. Artificial Denture. John J. Stedman, La Porte, Ind Filed December 21, 1891.

474,131. Dental Cervix-Clamp. James W. Ivory, Philadelphia, Pa. Filed August 2, 1890.

474,132. Dental Matrix-Retainer. James W. Ivory, Philadelphia, Pa. Filed May 11, 1891.

474,967. Dental Process. Joseph Payne, Dwight, Ill. Filed February 9, 1891.

474,968. Dental Articulator. Joseph Payne, Dwight, Ill Filed February 9, 1891.

475,141. Artificial Tooth. David B. McHenry, Grenada, Miss. Filed December 21, 1891.

CONNECTICUT STATE DENTAL ASSOCIATION.

THE Twenty-eighth Annual Meeting of the Connecticut State Dental Association was held at Hartford, Tuesday, May 17. A pleasant session closed with the annual dinner at "The Henblein." The following officers were re-elected:

Dr. E. S. Gaylord, of New Haven, President; Dr. C. C. Barker, of Meriden, Vice-President; Dr. George L. Parmele, of Hartford, Secretary; Dr. Joseph H. Smith, of New Haven, Treasurer.

Executive Committee.—Dr. James McManus, Hartford; Dr. William H. Rider, Danbury; Dr. Daniel A. Jones, New Haven.

G. L. PARMELE,
Secretary.

ILLINOIS STATE DENTAL SOCIETY.

THE Twenty-eighth Annual Meeting of the Illinois State Dental Society was held at Springfield, May 10–13, 1892. The following officers were elected for the ensuing year:

President, E. K. Blair, Waverly; Vice-President, N. Johnson, Chicago; Secretary, Louis Ottofy, Chicago; Treasurer, W. A. Stevens, Chicago; Librarian, F. H. McIntosh, Bloomington.

The next meeting will be held at Rock Island, second Tuesday in May, 1893.

LOUIS OTTOFY,
Secretary.

MASONIC TEMPLE, CHICAGO.

BUFFALO DENTAL ASSOCIATION.

AT a meeting of the Buffalo Dental Association, called for the purpose of considering the action of the University of Buffalo in conferring honorary degrees in dentistry, the enclosed preamble and resolutions were adopted with but one dissenting voice.

"WHEREAS, The dental colleges of the United States, recognizing the needs of the profession, banded themselves together in 1884 in a voluntary association known as 'The National Association of Dental Faculties,' for the purpose of raising the standards in all matters pertaining to dental education; and,

"WHEREAS, In order to reach this end they surrendered a right secured to them by their charter and long exercised by them, the right to confer 'honorarily' the degree of Doctor of Dental Surgery; and,

"WHEREAS, This voluntary action on the part of the colleges met with the hearty approval and support of the whole dental profession; therefore

"*Resolved*, That we, 'The Buffalo Dental Association,' believing it to be the duty of the profession to uphold and sustain the colleges in every effort for the uplifting of the standards of dental education, desire to express our unqualified disapproval of the granting of honorary degrees in dentistry under any and all circumstances, but more particularly when it is done, as in the recent action of the 'University of Buffalo,' for the express purpose of fitting men to hold positions in the Faculty of a proposed dental department.

"*Resolved*, That we earnestly ask the profession to so rebuke this action of the 'University of Buffalo' as to make it certain that hereafter no university will dare do that which no dental college can do without losing its standing in the dental profession."

W. C. HAYES, M.D.S., *President.*
RICHARD KESSELL, D.D.S., *Secretary.*

COMMENCEMENT.

UNIVERSITY OF PENNSYLVANIA—DENTAL DEPARTMENT.

Matriculates	169
Graduates June, 1891	8
Graduates May 6, 1892	84
	92

Selections.

HAND DISINFECTION.

THE complete disinfection of the hands preparatory to obstetric or operative work, particularly abdominal surgery, is so essential that the recent observations of Dr. Howard A. Kelly[1] are deserving of the widest publicity.

The common pus-producing germs, especially the *staphylococcus pyogenes albus*, are found abundantly on the hands and about the nails of everybody. To remove them and render the hands perfectly aseptic is by no means easy. The most certain method, and therefore the one to be followed, seems to be the plan which Dr. Kelly advocates.

Sixty-five experiments were made to test the adequacy of soap and water alone. The hands were thoroughly scrubbed with strong

[1] American Journal of Obstetrics, No. 12, 1891.

rown soap and hot water from ten to twenty-five minutes. In ne instances the hands were found to be aseptic, but in these nine stances the hands had been washed in bichloride of mercury solu- on the day before.

Immersion of the hands in solution of bichloride of mercury as rong as 1:500 was found to be insufficient to actually destroy the icro-organisms. After immersion in this solution, the epidermis d not yield cultures, but if the hands were subsequently treated ith a *sterile* solution of ammonium sulphide, living germs could e obtained from the epidermis. The bichloride inhibited the growth ıt did not kill the germs, so that when the mercury was precipi- ted by the ammonium sulphide, the germs immediately com- enced to grow.

By similar experiments, lysol and also peroxide of hydrogen ere found to be inadequate. The method which yielded the best sults, and which in fifty experiments rendered the hands aseptic forty-four instances, was the use of potassium permanganate and xalic acid.

This method, as described by Dr. Kelly, is as follows:

"1. Scrubbing the hands, with especial attention to the nails— ot more than one millimetre in length—for ten minutes, in water, requently changed, at about 104° F.

"2. Immersion of the hands in a solution of permanganate of otash, made by adding an excess of the salt to boiling distilled ater, until every part of the hands and lower forearms is stained deep mahogany red or almost black color. They are then trans- rred at once to a saturated solution of oxalic acid until completely ecolorized, and of a healthy pink color. This decolorization is ccompanied by a sense of warmth, due to chemical reaction, and sharp stinging wherever there is any abrasion of the epidermis.

"3. Washing off the oxalic acid in warm sterilized water."— *ournal American Medical Association.*

EUROPHEN.

This new iodine product and antiseptic has now been on trial in ıe hands of the profession for several months. The results ob- ıined by it have been generally favorable. It was designed to re- lace iodoform, and it was hoped also that it would prove a substi- ıte for the time-honored specific medication in constitutional philis.

Europhen is a yellow, resinous powder, with an odor resembling that of saffron. It is insoluble in water and glycerin, but dissolves easily in alcohol, ether, or chloroform. Solutions decompose rapidly Europhen is five times lighter than iodoform.

Clinically it appears to be a perfect substitute for iodoform. I prevents the development of micro-organisms, and it is soluble i the same menstrua as iodoform. It has the advantage over iodo form that large percentages of it will remain in solution in fixe oils. Furthermore, it is relatively free from odor and non-toxic.— *Atlanta Medical and Surgical Journal.*

TO DEODORIZE IODOFORM.

THE following combination is allowed by the Addendum of th *Netherland Pharmacopœia* to deodorize iodoform: Carbolic aci one part; oil of peppermint, two parts; iodoform, one hundred an ninety-seven parts.—*New York Medical Journal.*

PEROXIDE OF HYDROGEN AS A DISINFECTANT OF WATER.

DR. ALTEHOEFER, after giving references to the literature of th subject, gives his own researches on the disinfective power of H_2(dissolved in water. He finds that the addition of one per one thou sand to ordinary drinking-water, to drinking-water containing sew age, or to water containing typhoid bacillus or cholera bacillu is quite sufficient to destroy the various saprophytic and pathogen organisms contained under these conditions, if it is obtained pe fectly fresh and kept in good condition, and if it is allowed to act f a period of twenty-four hours. It is specially valuable for the di infection of drinking-water because it does not affect the taste, do not alter the color, and, in the proportion mentioned, is perfectly i nocuous. As regards cost, he calculates that sufficient drinkin water—say ten litres—for a family may be sterilized by means H_2O_2 at a cost of about two pence per diem.—*Quarterly Therapeut Review.*

THE

International Dental Journal.

VOL. XIII. AUGUST, 1892. No. 8.

Original Communications.[1]

THE FIXATION OF DENTAL MATRICES AND THE PACKING OF GOLD AT THE CERVICAL PORTION OF THE CAVITIES.[2]

BY DR. LOUIS JACK, PHILADELPHIA.

THE consideration of these important features connected with the use of dental matrices is entertained for the reason that the difficulties which have usually been encountered have generally pertained to these two procedures.

The general purposes of the matrix are to make less difficult the formation of the proper contour of proximate surfaces, to effect the placement of the gold in exact adaptation to the cervical wall with sufficient solidity, and to secure these ends without injury to the structure of the teeth.

This appliance greatly facilitates the packing of cavities on the distal proximate surfaces of molars and bicuspids, for which surface it is more especially intended as being particularly well adapted to these positions.

With the increased deftness which grows out of experience with this aid, it becomes frequently an important assistance to the performance of many mesial proximate cavities.

[1] The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

[2] Read at a meeting of the American Academy of Dental Science, held at Boston, March 2, 1892.

It is not necessary to dwell upon the details of the preparation of the carious cavity. Let it suffice to state that when the cavity is situated on the distal proximate surface of the molars, the opening of the orifice should include a large portion of the masticating plate of enamel; that the walls should be undercut at the inner and outer margins, so far as may be done without weakening the strength of the borders; that it is not necessary the undercutting should extend entirely to the cervical margin; that the cervical wall should be transverse to the axis of the tooth and be formed without undercuts or retaining pits; that the margins at all points should be countersunk, but to a much less degree at the cervix than at the lateral margins. It is also important the margins of the cavity be polished to facilitate the movement of the gold by the removal of the friction. When the cavities are situated nearer the front of the mouth, the removal of the masticating wall becomes only so far necessary as to facilitate the introduction of the gold and to eliminate so much of this plate as may be subject to impairment by the force of mastication.

For the ordinary cases of teeth which are not impaired by fracture or by the loss of structure by previous extensive cutting, the forms of matrices which I use are the depressed and those of plane surfaces bent and formed to meet the exigencies of the case in hand.

Where the depressed form is used the depression should correspond in size to the dimensions of the cavity, and its edge should extend a short distance above the cervical margin. This form of matrix is better adapted when the margins of the cavity have been so far weakened by carious action as to necessitate trimming away a portion of the buccal wall, and where for reasons beyond control the teeth are considerably separated.

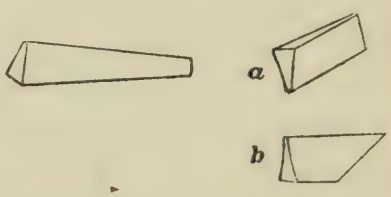
The plain matrix is better adapted when the separation between the teeth is slight. It should be stated that in all cases it is necessary for the securement of correct results that the preliminary step in each case should be the separation of the teeth by pressure this is to enable the parts to be properly finished, and to have the gold of the one tooth come into contact with the gold of the adjoining tooth at the natural points of contact of the proximate surfaces of the teeth. These preliminaries enable the consideration to be made of the fixation of the selected matrix.

The important requirements concerning this procedure are that the matrix shall be in contact with the cervical surface of the tooth as nearly throughout that margin as it is possible to have it; that

he matrix shall be in contact with the lingual margin of the cavity, nd be in near contact with the palatal margin below the cervical ortion.[1] This feature of the fixation of the dental matrix is at ome difference with the views of some others concerning this oint, but I hold that to impact the gold by the percussive force ecessary to produce contact and solidity at the cervical border the ne of junction should be a close one. This hypothesis has been orne out by considerable experience with the two conditions of roximity and apparent contact. The securement of contact at hese two points of the margin is attained by the peculiar form of he wedges to be used. The one for the cervical border is a double vedge. The sectional dimensions depend upon the space at the ervix and somewhat upon the general area of the cavity, and its ngth upon the lateral size of the tooth. This wedge, after being ipped in Sandarac varnish of the consistency of syrup (any xcess of the varnish being removed), is forced into the space by ressure. If of proper size it should appear at the inner margin, nd extend beyond the outer surface far enough to allow a grasp to e made for the removal. The wedge for the palatal margin is also mewhat of double wedged form, but it is not sharp at the point.

At *a* (Fig. 1) the piece appears as a simple double wedge having n even width, but becoming thinner n the back at the end, to be applied the cervix. At *b* the end is cut the form presented. It should be size to correspond to the space tween the matrix and the tooth ljacent to the subject of the operaon. When the tooth is much unded the face of the wedge often requires to be hollowed out ith a gouge, the better to adapt it to the space. This wedge is rnished, put in place, and forced into position by an instrument shed against its thick edge at the upper part. The object of the itre-like form at the end now appears, as this surface corresponds the line of the cervix. In some cases this end will be apposed ainst the cervical wedge; in other cases it will pass between the jacent tooth and the cervical wedge. In either case it makes this rtion of the matrix secure and permits the contour to be effected.

FIG. 1.



[1] In using the words "above" and "below" in relation to the cavity, the th is considered out of its topographical position, the apex being considered ve and the corona below.

It may appear a small matter to dwell with so much deta upon so apparently trifling a matter as a wedge for this purpos and yet it is upon the absence of definite knowledge of a correctl mechanical fixation of the matrix that has prevented many opera tors from securing the great benefits which are to be found in th employment of matrices. It is, I believe, the absence of the thought ful application of these simple means which has led to the inventio of complicated and, I believe, less effective methods for fixation. I will be perceived by the accompanying casts the adaptation of thi method to which attention is directed.

THE FILLING OF THE CERVICAL PORTION.

The chief elements connected with this feature of the subjec concern the character of the gold, the form of the pieces of gol the form of the instruments best adapted, and the method of apply ing the instruments. Each of these considerations is importan and a disregard of the qualifications of the filling material or c any of the essential procedures may defeat the ends to be secure by this system of filling cavities.

The gold to be employed for the upper half at least of the spac should be non-cohesive and soft; that is, it should be incapable c being rendered cohesive by heat, and should remain soft and leac like during the manipulation to which it is subjected. The gold have found to fulfil this requirement more nearly than any othe which I have used is the so-called soft gold of Morgan & Hasting The soft gold of Abbey & Sons is also well adapted, but each on should make his own tests of the quality in this respect of the gol to be used.

The reason that gold of a cohesive nature should not be em ployed is that the portion in immediate or close relation to th instrument may become consolidated and bridge before the poi in such a manner as not to permit the force to be expended to th ultimate portion of each piece of gold which is being moulded int position and undergoing consolidation.

THE FORM OF THE PIECES.

That form which will be found best adapted in the larg cavities is produced by folding a tape into a block. The tape formed by folding from one-third to a whole sheet of No. 4 or N 5 three times, thus producing a tape of eight layers. The divisic of the sheet is dependent upon the dimensions of the space a somewhat by the strength of the walls. The folding of the ta

nto blocks is also, as to form and number of turns made, de-
)endent again upon the size of the cavity. These variations can
)nly be learned by the study and experiment which each one
hould make for his own guidance, and for which no theoretic rule
:an be defined.

THE FORM OF THE INSTRUMENTS.

It is obvious the shape of the plugging instruments to be used n this system of stopping cavities must be different from those vhich are applicable to the ordinary methods. The bends of the hank should be such that the points may reach all parts of the :avity, and the form of the ultimate point is required to be that vhich will be best calculated to produce adaptation and solidity of he gold at the lines of apposition of the matrix and the walls of he cavity, and also should be so shaped that by slight rotation of he instrument on its axis the point may reach into the retaining grooves, to carry on the consolidation of the gold at this point.

Fig. 2 represents the shape which I have found to be more nearly universal for this purpose than any others, and, as will be seen, differs only in the form of the ultimate point first described and published as a matrix plugger.

FIG. 2.



It will be observed the ultimate point is not flat and transverse to the axis, but that it is ovoid and slightly bevelled to give the extreme edge a little to one side. This necessitates the points to be in pairs, but for the general packing he points are transverse laterally and slightly ovoid. In the use of the instruments the edge is held at an angle to the marginal ine, to prevent the point being driven between the matrix and the nargin of the cavity; by this caution and slight tilting movements left use of the instrument is quickly acquired.

When these are made of several sizes and of slightly varying)ends they will meet the requirements of any case which may)ccur. The serrations are made very fine, and are necessary only to nhibit the instrument cutting the foil and to maintain a frosted surface, which prevents too easy sliding of the gold.

THE PACKING OF THE CERVICAL PART OF THE SPACE.

The chief ends in view in the use of matrices are the facilita-ion of the procedure of packing the gold and the perfect adapta-

tion of the gold to the cervical wall. The difficulties attending the adaptation of gold-foil to the cervical walls of distal cavities, as applied in the ordinary methods, are caused partly by the posterior position, and partly by the physical tendency of gold to draw away from the margins during the packing process. This tendency pertains to all forms and kinds of gold used. When the cases are upon accessible surfaces this disposition is overcome by leverage movements of the filling instruments, and by the employment of foot points. On the distal surfaces, when the spaces are comparatively small, the opportunity for leverage does not exist, and the foot point is not convenient of application.

There is another important advantage this method possesses. When distal cavities are filled by the ordinary plans, it is necessary either to produce deep retaining grooves near the cervical region or to make retaining pits at this part. Each of these have serious objections; the first weakens the lateral walls, and the latter impairs the vitality of the adjacent portion of dentine, and also in many instances imperils the safety of the pulp. These deep retaining means are then necessary to insure that degree of securement of the first pieces of gold as to permit the malleting with the foot points to bring about adaptation without causing displacement of the gold. As before stated, the retention when the matrix is used need not be by undercutting at the upper part of the lateral walls.

When all is in readiness, a block of the gold is seized in the pliers and carried towards either cervical lateral position in such manner as to direct its end towards the countersink. It is then secured by the use of any suitable plugger which will fix it in position. The opposite aspect of the cavity is treated in the same manner when the special pluggers are used to force by percussion the blocks into adaptation with the margins. A third piece is next adjusted between the two. When this is fixed in position careful adaptation may be effected by going over the whole surface, particular attention being directed to secure contact along the line of junction of the matrix with the walls.

The size of the selected blocks should be such that they will by their dimensions assist by the friction in holding their place. As the gold should be soft and yielding, there will be no impediment by the size unless this should be out of reasonable relation to the dimension of the space to be filled. When the first layer is completed others may be made seriatim until the upper third or half of the cavity is filled, when the major part of the balance should be completed with cohesive gold. For this part my reliance has been

pon No. 20. The amount of force required to effect the consolida-ion is not great, and as the gold is confined by the limitation of the pace it can easily be brought into adaptation. When the auto-natic plugger can be used, the force of the short blows of this is ufficient. The Bonwill mechanical mallet is also well adapted in ts force to effect the consolidation, and is peculiarly well suited to nesial surfaces.

I have in some detail thus described a procedure which, in my wn experience and that of others, has proved of great value, not nly as a means of effecting good results, but as a measure which acilitates the completion of the most difficult class of operations vhich we are called upon to perform.

CROWN- AND BRIDGE-WORK.[1]

BY DR. C. M. RICHMOND, NEW YORK.

(Continued from page 489.)

In this, my second article on crown- and bridge-work, I have hown an upper set of teeth with the attachments all on one side of he mouth, except one bicuspid, which makes it a very interesting peration, unlike a piece of bridge-work where the points of attach-nent are evenly distributed, or nearly so. We must study the case nd see how we can make the work so it will be held firmly in osition, and not draw on some of the teeth more than others, and o ruin the whole structure. In this operation, like my first one, ve must primarily have perfect-fitting attachments, bands, and osts, and the whole must, when in position, fit so exactly as to be mmovable in any part of the structure.

This operation has a double interest, as it has been through all f the evolutions from single crowns, with a plate to fill out the et; then for ten years wearing a fixed bridge. But now comes a eautiful movable bridge, to take the place of all the old experi-nents; and the operation is, after all the trials of the preceding ases, a monument to the principle upon which it is constructed.

The two bicuspids and molars have gold crowns, and are the rst ones put in the mouth by Dr. E. O. Cochrene, 850 Market treet, San Francisco, eighteen years ago; and the method he then mployed was making a gold band to fit a metallic die of each

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[1] Copyright, 1892, by Dr. C. M. Richmond.

tooth, then soldering a flat top on to each band, and making each cusp of solid gold and soldering into position, one at a time. This was slow and tedious work, compared to the method now used for making gold crowns, but the crown is beautiful and durable, and has thickness enough so that it can be ground and articulated perfectly, without the danger of cutting through. This method of construction has made it possible to use the same old crowns through all the changes that have been made in this case for the past eighteen years.

Referring to the cuts, Fig. 1 shows the cap and square tube with top or piece in position, ready to receive the porcelain tooth as shown in Fig. 2. Each of the roots, as shown in the cut, Fig. 3, have been fitted with the band, which is bevelled on the facial surface, the same as if it were to be made into the original Richmond crown method.

The top is covered with two pieces of plate; that is, I solder first the flat part on to the band, then the bevelled surface piece is soldered into place. I have now a gold cap that fits the roots perfectly, and having previously made some square tapering gold tubes (which in turn receive a perfectly-fitting iridio-platinum pin), I wax them into the square holes in the top of the gold cap, trying each one into its respective root to see if they are in the right position to allow the bands to go down to their places after they are perfectly adjusted. I then take each one and invest it in the ordinary way, fitting the square tube with a little of the investment far enough to prevent the solder from running into or making the tube imperfect. The least solder will ruin the perfect fitting of the pin into the tube.

The greatest care must be used in each step, or the work will not be what we term "working to the line;" no half-way guesswork will do; everything must be perfect.

After each cap is fitted on to the roots, with the tube in as shown in Fig. 3, I now grind the teeth into position on each bevelled surface on the caps, while they are on the roots; the length of tooth, the pitch, in or out, the irregular position, if it is desired, are all determined here. The caps are now removed and the pin and half-caps are made to slip into position waxed together, as shown in Fig. 1.

The half-band is now bent to fit the inner surface of the cap, and the cap is soldered on to it, being careful not to use solder enough to allow of any imperfection by the solder running inside of the half-band. The pin and half-band must be invested and

Fig. 1.



Fig. 2.

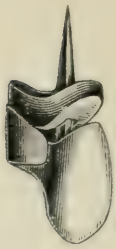


Fig. 3.

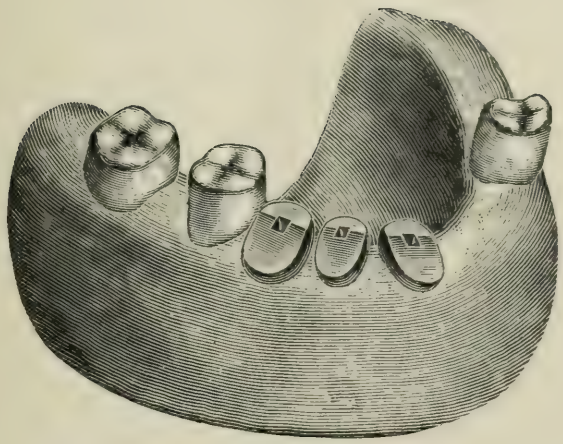
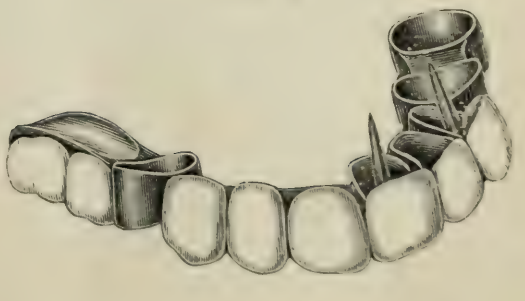


Fig. 4.



Fig. 5.



solder enough to catch the pin to the half-band, and then we are ready for the porcelain.

I have referred to grinding the teeth to the caps in the mouth; the case can now be waxed so that it looks like Fig. 2, and has the same appearance after it has been invested, and the tooth soldered to the pin and and half-cap.

After these three teeth are finished, as in Fig. 2, I put each tooth into position on my caps and cement them in said position, and after I have removed the three teeth we have the case as shown in Fig. 3.

This case is now ready for the teeth. The molars and bicuspids and gold crowns are a trifle smaller at the cutting edge, so that when an impression of them is taken and our metallic dies, as shown in Fig. 4, are made, we can make a telescopic band that will go on to the place when it is fitted and will go no farther; so that when we have the work done and put into position, each band and each pin and half-band will all stop and have their perfect bearing at the same time.

Between the teeth (the incisor and bicuspid) is a bridge, but beyond the bicuspids I put the case on to a perfectly-fitting small gold plate.

The mode of procedure from this point is to take an impression of the case with the three teeth in position; the teeth will come out with the impression, and, after fitting the impression with the investment, the plaster is cut away and the teeth are perfectly covered with more investment, and these three teeth are soldered together. These can now be put on and taken off while the three teeth are being waxed into position to fill the space from the centre to the bicuspid after the six front teeth are all right and in their proper position.

I now place the two gold bands previously made for the bicuspids into place, with the six front teeth also in position. I now take a plaster impression over the case, and after filling the impression (with the two gold bands and the six front teeth in it) with investment, cut away the plaster and cover the teeth with more investment, and solder the case. We have now the six front teeth and the two gold bands in one piece. The object of putting this case together in detail is to insure a perfectly-fitting piece of work. Where so much soldering and so many teeth are put together in one piece it is not possible to arrange and solder it as a whole and be successful.

After the work is soldered to this point it is put into position,

and the gold band is placed on the molar and an impression is taken of the case (being careful to get it beyond the bicuspids), where we are to fit a small plate to the gum, on which we are to place two more teeth, and solder the whole together in one piece, as shown in Fig. 5.

In making the plate to carry the two teeth, I use a piece of pure gold (30 thick, U. S. gauge), and it can be burnished to fit the cast with slight pressure. I then back up two plain molars with pure gold and wax them into position, and the soldering is done in the usual way.

The last gold band is soldered to the case at the same time the two molars are finished. The case will now go on to the gold crowns, and a perfect fit is the result if all the details are carefully carried out. This case, after years of wear, is as firm and perfect as if it were made yesterday. All the pathological conditions must be understood in these extensive operations, as it is *imperative* to complete success.

I will now give my method of management of all classes of teeth and roots that we are called upon to treat pathologically.

When first beginning the practice of crown-work as a specialty, my mode of treatment of these roots was similar to that followed by the profession for twenty years. But from rapidly-accumulating operations, the necessary delay in the treatment of teeth termed dead, or those with devitalized nerves, was very annoying, not only to myself but to my patients.

The mode which I here propose to give was brought about entirely by chance. I had occasion to excise a tooth which had a live nerve in it at the time, upon the root of which I wished to place a piece of bridge-work, this tooth to be one of the abutments. The operation was one that required three or four sittings; and after the crown had been excised, and the live pulp extirpated, in the manner which I shall speak of hereafter, the canal of this root was left open. The next morning the patient came to the office, suffering from very severe acute periosteal inflammation; exactly the condition of things that we expect the next day after cutting into a dead tooth, so called, or removing the pulp from such a tooth.

This demonstrated to me the fact that this condition of things was not due in either case to the previous death of the pulp, but was brought about by the presence of the atmosphere in the pulp-canal and its penetration through the foramen into the soft tissues.

From this discovery, I commenced my experiments in the management of crownless roots, and I treated them in exactly the same

manner, no matter what their previous condition had been, the esult being universally satisfactory.

I classify the different conditions that I find existing in teeth, vhere the pulps have been previously devitalized, by first giving description of my mode of treatment of a tooth where it is ecessary to remove the pulp when in a healthy condition.

In practising the crown- and bridge-work, as hereinbefore set orth, it has often been necessary to sacrifice a good crown for the ake of utilizing the root in the operation ; and so well satisfied am I f the result of these operations that I never hesitate for a moment o excise the living tooth for the purpose of this attachment.

In excising the living tooth I always make an application of erve-paste. Twelve hours later a crown so treated can be re- noved and the pulp extirpated without pain. After removing the rown and extirpating the pulp, I immediately wash out the canal vith carbolic acid, and provide a piece of orange-wood whittled own to fit the shape of the pulp-canal. After being thoroughly aturated with carbolic acid this wooden plug is driven to its place n the canal by a slight tap of a mallet. A tooth treated in this anner will remain in the mouth as long, and do as good service, s its nearest neighbor with a living pulp.

I arrange these teeth as follows, and give the treatment per- ued in each class.

First, teeth the pulps of which have become devitalized, from hatever cause, and which had never given the patient trouble, or dications of it; the pulps still living.

Second, teeth where the pulp is dead, and a dormant abscess exists t the apex of the root, but from which the patient has had nothing ore than a slight feeling of something abnormal existing there.

Third, roots where the pulp is dead, and an abscess has formed ith a fistula externally through the process and gum-tissues.

Treatment of first class. Whether these cases are treated by emoving the crown or through the cavity which may have been rmed by decay, or been opened with the drill, I first apply, after e pulp-chamber has been thoroughly exposed, a drop of carbolic id, through which must pass whatever instrument I use for eaning the pulp-canal. I then very carefully follow up into the nal with the instrument (usually a delicate piece of orange-wood hittled to shape for the purpose); the carbolic acid all the time osing the mouth of the canal completely, and thereby preventing e atmosphere from entering it. In this way it is soon thoroughly eansed without pressure, and with very delicate manipulation ;

every particle of the decayed pulp being removed. The piece of orange-wood is now driven into the canal and cut off, in precisely the same manner that I have described in the extirpation of the live pulp.

Treatment of the second class, or roots where the pulp is dead and a dormant abscess exists without a fistula. This class of cases is generally found in the mouths of people of robust constitution, and the circulation carries off the blood and no fistula forms. These teeth should be treated in precisely the same manner as the preceding class, great care being exercised during the cleansing of the pulp-canal to thoroughly exclude the atmosphere by the application of carbolic acid.

Treatment of the third class, or teeth where abscesses have formed as the result of dead pulp in the roots, and there being a fistula through the gum. These cases are treated precisely as those already described, except that a rose-burr is introduced through the fistula to the end of the root, and a dressing of cotton lint saturated with carbolic acid left there as a tent. These cases will almost always recover with this treatment; whereas, if the dentist, in his anxiety to cure the lesion by the ordinary treatment, pumps into the fistula iodine, aconite, carbolic acid, creosote, iodoform, etc., and then carries the case to the local society with its history and asks, What else shall he do to effect a cure? The answer comes from one having had similar experience, "Give it a rest!" The first faint shadow of good sense then creeps into the brain of the operator, and he sees that, in his anxiety to cure the case, he has put it into a worse condition than it was at first by *over*-treatment.

I will now give the history of some noted cases, which were operated upon by myself in New York for the purpose of demonstrating to dentists, among whom were Dr. J. L. Williams and others, who had witnessed the uniform success of my treatment and had seen the failure of the old methods. The first case I shall describe is that of a gentleman who, from a blow, had the six inferior front teeth partially driven out of their sockets, so that the pulps were severed, and when these teeth were pressed back to their position and had become firm again, they were very much discolored, and the gentleman wished to have them replaced with artificial crowns. He was of such a robust constitution that the teeth had never given him any trouble, even so much as an acute inflamation would produce, to say nothing about a dormant abscess or a fistula, so that it was a satisfactory case for the demonstration of my theory; and I said to the gentlemen in my office that I

would here prove to them the uniform success of my management of such teeth, and at the same time demonstrate how useless the methods ordinarily used. I took five of the six teeth and thoroughly cleansed the pulp-canals as I have described, being careful that no atmosphere should penetrate into them, and they were all filled at one sitting with a piece of orange-wood whittled to the shape of the pulp-canal, as heretofore described, and driven in with a mallet; the sixth tooth I cut open and treated in the ordinary way, using no carbolic acid to prevent the atmosphere from penetrating into the canal, but cleansing it thoroughly and packing it lightly with cotton and carbolic acid; treating it exectly as such teeth are usually treated by the dental profession. The result was that the next day the five teeth which I had handled according to my method, or in the manner described above, gave no signs of soreness or trouble, while the one which had the cotton lint and the carbolic acid, and was left open, developed an abscess; the man's face was very much swollen, requiring an opening made with a drill to relieve it. The results of these different modes of treatment of teeth in the same condition and in the same mouth and at the same time demonstrate the superiority of my mode of treatment, and that there is no mistake about the uniform good results claimed for it.

Another case which I will describe is that of a person of robust constitution, who desired to have some artificial crowns placed upon a number of roots in the upper jaw, which had been excised and filed down even with the gum for the purpose of putting in a gold plate.

I found the nerve-canal of these ten superior teeth filled with debris of dead pulp and other foreign matter. I treated them the very first time I met the patient in the manner above described. The next day, when the gentleman called, he was suffering no inconvenience whatever, and the operation of placing crowns upon these roots was at once commenced. As fast as a crown was set, a tooth was cut from the gold plate to allow it to go back to its original position, and the operation was continued. The third day after the operation was commenced and the pulp-canals were filled, a slight soreness was complained of in the canine tooth, which had been crowned the day previous. I inquired of the patient whether he had ever had any trouble from it before, and found that he had sometimes felt a stiffness, as he termed, in that immediate locality. The gum and process were at once punctured to the apex of the root, and the next day he was perfectly happy. I placed in this mouth twenty-six artificial crowns. The roots were all treated in

precisely the manner which I have above described. The case is now of thirteen years' standing, and I have never had the least complaint from this patient in regard to any of those teeth.

In conclusion, concerning the theory of my treatment, I will say that it is only carrying out the same ideas that are now followed in latter-day surgery, in this respect, that all forms of animal life in the atmosphere are entirely excluded by the use of a spray of carbolic acid, listerine, or other well-known applications, thereby causing the wounds to heal without suppuration. I therefore simply advocate the prevention of the cause of the trouble. Let the manipulations be carefully and delicately performed, and the result will be most satisfactory, and all who try the mode which I have here described will have no cause to regret changing their method in the treatment of such teeth. I can also add that all those that have been doing this for years are satisfied with it, and those who will adopt it can be made happy, and their patients thereby saved the annoyance of a most disagreeable experience by lack of knowledge of a better mode.

GENERAL ANÆSTHESIA.[1]

BY E. J. BUCK, WARREN, MASS.

To treat the above subject intelligently, it is necessary to present many points with which you are perfectly familiar; facts obtained both by experience and from authority. I may not give you much that is really new, except a few methods and experiences that I have found useful and interesting.

For the term as used to designate the peculiar state under consideration we are indebted to Dr. Oliver Wendell Holmes. Its literal meaning is a want of feeling or sensation. Exactly where to draw the line between symptoms induced by alcohol, ether, chloroform, opium, and its derivatives, cocaine and many other kindred drugs, their actions upon the system resembling each other perhaps only in the ultimate result, coma, may be considered merely technical. Allowing the significance of the term, I should certainly eliminate some that are now enumerated in the list.

Its history would be one of extreme interest had we facts

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[1] Read before the Connecticut Valley Dental Society at their annual meeting held at Greenfield, Mass., January 1, 2, and 3, 1892.

nstead of the vague and almost mythological references found in ncient and modern literature. So far as I am able to say, it began vhen Sir Humphry Davy, about the year 1800, attempted a scien- ific investigation of nitrous oxide and its actions upon the human ystem. His researches were cut short by other, and what seemed o him more important, duties. Thus, for another half-century umanity was compelled to writhe under the knife and die of naladies that are now, through the use of anæsthesia, considered menable to surgical treatment. At that time he made the follow- ng suggestion: "As nitrous oxide in its extreme operation ppears capable of destroying physical pain, it may possibly be sed to advantage during surgical operations in which no great ffusion of blood takes place."

In 1844, Dr. Horace Wells, of Hartford, Conn., by the merest ccident, discovered, or rather observed, some of its properties; and, ollowing up the hint, at his own suggestion submitted to a trifling peration under the influence of the gas. He was so well pleased vith the result that he at once commenced to experiment upon any nd all who would inhale it. In all probability he was entirely gnorant of its physiological action, or that any danger might ccompany its use.

My personal experience with the agent has been as limited as I ould possibly make it. One of the early theories of its action (I o not recall the author) was that of a spasmodic contraction of he pulmonary blood-vessels through the vaso-motor nerve, and was ased upon the result of several post-mortem examinations, in hich the right cavities of the heart were found gorged with lood, while the left auricle and ventricle were entirely empty,—a ondition of the parts probably brought about by some cardiac sion, resulting in immediate and fatal syncope.

The more recent researches of Dr. H. C. Wood lead us to very fferent views as to its direct actions upon these organs, while he final results remain the same. He says, "The knowledge we ave of the physiological action of nitrous oxide indicates that has no inherent anæsthetic properties, but that the loss of con- iousness which follows its inhalation is the result of asphyxia, nd that there is not only no proof that nitrous oxide has the ower of yielding oxygen to the tissues of the body, but our present nowledge indicates that it escapes from the lungs unchanged."[1] does not seem possible that any operator would pronounce the

[1] *Therapeutic Gazette.*

condition other than asphyxia, or that he would willingly inhale the gas after witnessing its action upon others.

"It has been demonstrated that animals live no longer in an atmosphere of pure nitrous oxide than they do in one of nitrogen, and that the latter will produce symptoms very nearly resembling those of nitrous oxide; that a mixture of nitrous oxide and oxygen will support life indefinitely, and finally that pure nitrous oxide is alike fatal to animal and vegetable life."[1]

Other facts brought out by the same author, and also by MM. Jolyet and Blanche, relate to pulse changes, arterial blood-pressure, and to the chemical changes which take place in the blood itself during its inhalation. Personally, I have observed that during the first stages the pulsations were reduced in frequency, while they were increased in force, and followed later by a very rapid and feeble movement, which in their experiments were accounted for by a stimulation of the inhibitory nerves. It was found that the changes in blood-pressure were enormous and rapid. First an increase in some cases to nearly twice the normal, followed by a progressive fall to zero, and were attributed to vaso-motor stimulation, followed by vaso-motor paralysis. The last symptoms are of the gravest importance in the practical exhibition of the gas, where it is known or suspected that lesions of the circulatory apparatus or blood-vessels exist, such as fatty degeneration, aneurism, or a tendency to apoplexy.

In concluding his report, Dr. Wood says, "The changes produced by nitrous oxide and nitrogen resemble somewhat those produced by mechanical asphyxia, and what difference does exist is not sufficient to convince us that nitrous oxide and nitrogen act as direct anæsthetics, and that the whole mass of evidence is concordant in showing that it is due to shutting off the supply of oxygen from the nerve-centres, and not to the accumulation of carbonic acid."[2]

The direct analysis of the blood seems to show very uniformly a displacement of oxygen in the tissues by the gas inhaled, accompanied by a marked decrease in amount of carbonic acid. As previously stated, nitrous oxide suffers no chemical change from inhalation; and since it parts with none of its oxygen, the formation of carbonic acid must necessarily stop.

There are some very grave after-effects apparently attributable to the inhalation of nitrous oxide. Just how they are induced

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[1] *Therapeutic Gazette.* [2] Ibid.

not so apparent. Several observers have found large quantities of sugar in the urine of patients after the inhalation of the gas, and from good authority come cases of permanent impairment of health dating from the same, such as menstrual suppression, epilepsy, diabetes, albumen urea, and indeed pulmonary affections, with one or more cases of miscarriage. I believe the inhalation of the gas is not without possible danger in all cases, and that it should be prohibited with pregnant women, and with young girls from twelve to seventeen years old. With persons subject to any cardiac affections it should be used with the utmost caution, if not prohibited entirely; with a patient having any renal trouble, with an habitual drunkard, or where there is an extreme nervous depression. In any case, it should only be administered by those who are perfectly familiar with its different phases, and who are able to apply prompt and intelligent measures, should occasion require. In our choice of an anæsthetic agent there is no good reason why we should select nitrous oxide in preference to sulph. ether, which we will now consider.

Ether was first discovered in the year 1540 by a German physician. Dr. Morton, of Boston, however, was the first to make a practical use of it as an anæsthetic. Unlike the discoveries of Dr. Wells, it was the result of a scientific comparison of alcohol and ether, as to what was known of the former and the possible action of the latter. After witnessing its effects upon his dog, he tried the drug upon himself, and probably was the first person to experience anything like its full effect.

Notwithstanding the low specific gravity of ether, its vapor is much more dense, and therefore heavier than common air. This is a fact we must not forget when necessary to operate by artificial light. We will pass its chemical and physical properties and consider its physiological action. Of this, unfortunately, we know but little. Alcohol has long been known to possess anæsthetic properties. Experimentally, it coagulates albumen by abstraction of water. The same is true with ether; but if this phenomenon has anything in common with the molecular changes in the nerve-centres during anæsthesia, it has not been sufficiently demonstrated to become a certainty.

The apparent order in which its action is exerted was first described by Flourens, in 1847. First, the cerebrum, resulting in loss of intelligence; second, the cerebellum, with loss of co-ordination of movement; third, the spinal cord, with loss of power to receive sensory impressions, and of initiating movements; fourth, the medulla, with paralysis of the respiratory and circulatory functions.

The treatment of symptoms and conditions, about which so little reliable information is at hand, or possible to obtain, is not a little difficult, and renders the subject open to the widest theories and speculation. It would seem proper, in the first instance, to refer to the phenomena of natural sleep. The refreshing influence and imperial necessity of such repose points clearly to the restorative processes going on within the body. Such a state is properly viewed as a normal condition, and yet how very nearly do some of its symptoms and outward appearances resemble what we term pathological coma. It has been demonstrated, in many ways, that during natural sleep the volume of blood in the brain is much diminished. The action of the heart and lungs is retarded, with a marked lowering of the temperature. Observe an infant. On going to sleep the scalp at the fontanels will be found to protrude for a short time, but when the deepest slumber is reached, just the opposite condition prevails. If we disturb it in the slightest degree, more or less evidence of an increased cerebral circulation is apparent. It seems probable that the above conditions are a natural sequence of sleep, rather than that sleep is a result of the condition. Just here the analogy must stop. There are, however, many highly interesting phenomena associated with natural sleep that are not pertinent in this place, but well worth reading.

We are compelled to draw other conclusions from the study of different forms of pathological sleep. In pronounced cerebral hyperæmia the cortical portions, together with the membranes and immediate vicinity of the large arteries, are found to be variously distended. As a natural consequence, the veins will also be found to be more or less strangulated and containing large quantities of venous blood. The above morbid condition would result, first, in depriving the deeper portions of an amount of blood sufficient for their needs; and second, those portions in the immediate vicinity of the greatest congestion would soon suffer from the vitiated condition of the blood supplied.

Anæmia of the deeper tissues must, and in fact does, accompany any considerable congestion of the cortex. How this is to be explained other than by strangulation of the deeper vessels is not easy to say. Hammond enumerates, among other symptoms of cerebral hyperæmia, confusion of ideas, hallucinations, morbid apprehensions of impending evil, furious delirium, profane and obscene language. If these are not sufficiently suggestive, we may add tinnitus aurium, the peculiar flushing of the face, and occasionally perspiration. The last symptom never occurs in the earlier

tages of ether anæsthesia, and would seem to be nature's attempt o restore a normal condition. A study of the graver forms of erebral irritation reveals the same train of symptoms. To those vho have observed the symptoms of apoplexy, where considerable xtravasation exists, the analogy becomes very marked.

While the outward appearances and actual conditions in ether næsthesia so closely resemble cerebral irritation, we must recog- ize some subtile, primordial influence upon the nerve-centres, by vhich these conditions are brought about. What that is, or how t is exerted, seems to me of little account, since we do not look in hat direction for a failure of the vital forces, and the length of ime during which a person in perfect health would endure the oxic effect of ether would be measured by the needs of the ervous tissues for actual nourishment. Experience teaches that vith ether, as with nitrous oxide, the greatest danger is from aralysis of the respiratory nerves.

It is very difficult to define the successive stages of ether anæs- hesia; some authors describing two, some three, others four. Of ourse its action is progressive, the patient passing through a first tage, or one of exhilaration, before losing consciousness or the ower to reason. I would term the latter a second, or stage of reams, for it is now that he receives those impressions which are ften the subject of confused comment immediately after waking. What has been described as a third or spasm stage I would include vith the second, the symptoms being the same except in degree, nd seem to be the very last evidence of cerebral function.

Finally we reach the third, or paralytic stage, the very first art of which is true surgical anæsthesia, and should be reached efore an operation of any magnitude is attempted. There is a me, however, during the very last part of the first stage, when inor operations requiring but little time may be accomplished vithout pain, and in many cases without the knowledge of the atient. (The safety of this practice, however, has been questioned.)

What we may say or think concerning the preparation of the atient amounts to but little, since that must depend wholly upon ie character and urgency of the case; but for obvious reasons ther should not be inhaled immediately after a full meal. It is much etter to wait from six to eight hours, and about half an hour efore the operation a glass of milk or coffee may be taken; not or the nourishment to be derived from it, but to dilute the con- ant stream of ether-laden saliva which will be swallowed during ie first stages of anæsthesia, and which, acting as a local irritant

upon the gastric nerves, will produce unpleasant results in most cases. If we can avoid this complication with the danger accompanying it, of particles of solid food being drawn into the air-passages, we have gotten rid of one of its greatest dangers.

I see no reason for giving alcoholic stimulants except in cases of extreme nervous depression. In case of shock, it might, as a special remedy directed to that condition, be administered. In such cases, unless an immediate operation were deemed necessary, I think you would prefer to wait for a reaction. The patient's clothing must not interfere with the circulation or easy respiration, and it should be so adjusted that it can be easily removed if necessary to reach the surface of the body. When possible, the temperature of the room should be raised to 70° or 80°, as it has an important bearing upon the rapidity of evaporation, and hence completion of anæsthesia. It will also assist in maintaining the temperature of the patient which, owing to "retardation of tissue-changes and the absence of the normal amount of oxygen admitted to the circulation, is considerably lowered, and may suddenly become dangerously low." If after we have studied our patient's condition, we deem it safe to administer the drug, his position must next occupy our attention. In this, too, we must be governed by the nature of the operation, never forgetting the possible dangers arising from cardiac and respiratory failure, together with danger of asphyxia from mechanical causes. Whatever position is chosen, we may meet with many difficulties that will require skill and judgment to surmount. Any unnecessary noise—such as talking, whispering, or laughing in the room—should be stopped at once, and no one but the operator speak to the patient. If it becomes necessary to use force to limit his movements, let it be applied promptly, otherwise it is much better to let him take his own course.

Of the many immediate dangers attending ether anæsthesia statistics show that asphyxia, either mechanical or from failure of respiration, is the greatest. During the first and second stages the mucous surface of the mouth and pharynx, together with the salivary glands, secrete large quantities of their respective fluids, which may find their way into the larynx, giving the patient much discomfort and often producing dangerous symptoms. "If the accumulation becomes too great, it is much safer to suspend anæsthesia until the throat is thoroughly cleared, or the patient is relieved by his own efforts." If by chance any foreign body should enter the larynx, and the patient be unable to dislodge it by the violent coughing it produces, we have a very unfortunate condition, the

equel of which will depend upon the operator's skill and courage.

In the third stage the tongue, becoming paralyzed, may fall back upon the epiglottis, thus interfering with the act of respiration. For the relief of this condition various methods may be practised, but that suggested by Dr. Howard will give the best results. The main features of this method are as follows:

"Place the patient upon his back" (preferably upon the floor), elevating the thorax by placing a roll of blankets beneath the scapulæ. In this position the chin will present to the ceiling instead of the face, so changing the line of gravitation that the tongue will fall from the pharynx and rest upon the hard palate. The entire posterior wall of the pharynx will be shifted backward, at the same time the larynx will be pulled downward and forward by the sterno-hyoid muscles; while the lower jaw, being lifted upward and forward, will cause a tension of the mylo- and genio-hyoid muscles, thus lifting the hyoid bone, and through the hyo-epiglottic ligament cause the epiglottis to share the same movement."[1] A few inhalations of air will restore the functions of the parts.

If we have escaped the preceding complications, our patient may suddenly and without warning stop breathing entirely from paralysis of the respiratory centres. The face becomes livid with rapidly increasing signs of asphyxia, the muscular system is completely relaxed, the pulse being reduced in frequency and force. The absence of muscular rigidity will differentiate this condition from one of simple spasm, in which respiration is voluntarily resumed in a few seconds.

No time should be lost in meeting this difficulty, either with the battery or artificial respiration, by one of the different methods. The position of Howard will favor whichever method is employed.

"One of the characteristic effects of ether is that in its progressive action upon the vital functions the respiratory centres become depressed more rapidly than the circulatory, the heart continuing to beat for some time after respiration has ceased." The greatest danger, as before stated, is to be found in this direction. Both the pulse and respiration should be closely watched, and any failure of the former will be found to have been preceded by an unmistakable depression of the latter. While cardiac syncope is very liable to occur in chloroform narcosis, happily it is very rare with ether.

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[1] "American System of Dentistry."

Should we be so unfortunate as to be overtaken with an accident of this kind, I know of no reliable symptom that will warn us of its approach. It is certain that well-defined indications of cerebral anæmia will announce its presence, if not discovered sooner, and to this symptom our efforts should be directed by placing the patient in such a condition that by gravitation a fresh supply of blood will reach the brain. We should make all possible endeavor to re-establish respiration, and, by well-directed manipulation over the cervical veins, assist the return flow of venous blood. Experiments with amyl nitrate have demonstrated its value as a remedy in cases of cerebral anæmia. This is supposed to be derived from its power to control many spasmodic affections, and by relaxing the muscular coats of the cerebral vessels it assists in restoring circulation. Given in doses of two to four minims, it is said to raise the temperature of the body.

There are, perhaps, but few conditions in which ether anæsthesia would be entirely inadmissable. Those would include some of the more serious cardiac troubles, especially if the patient is very old. When the action of the lungs is considerably limited, or where there is an excessive secretion from irritated surfaces along the respiratory tract, we must be very cautious. Drunkards, opium-eaters, or persons who are known to faint from slight causes, as well as cases of advanced pregnancy, must be treated always as dangerous.

The after-effects of ether anæsthesia, so far as it is known, are very few. More or less pulmonary congestion must always follow, causing with some patients a slight cough, which may last from one to two days. The patient must be cautioned against undue exposure, otherwise, if the conditions be right, pneumonia may result. The severe headache produced by cerebral congestion may be relieved by appropriate treatment, and, unless the patient be advanced in years or has a tendency to apoplexy, is not a grave symptom. The ever-present nausea, a sympathetic manifestation of the preceding condition, is one of the most distressing and objectionable features of ether narcosis. If the patient remains supine and is allowed to sleep off the drug, it will generally disappear as the normal circulation is resumed. Chloroform given internally in doses of two to four minims will relieve and often control the most persistent vomiting. I have used, also, pure creosote in one-minim doses, both of which act as a local anæsthetic upon the gastric nerves, thus tiding over the difficulty until other conditions prevail.

Finally, the patient should be closely watched until he has completely recovered, for even now the vital forces may suddenly fail.

Much can be said of chloroform, but after we had finished we should be compelled to add, don't use it. The sphygmographic tracing of a patient under its influence says, in unmistakable terms, do not use it. It is said to have been discovered by a Dr. Guthrie, formerly of Brimfield, Massachusetts, in 1831, and independently in 1832 by Liebig. It seems to unite with both alcohol and ether, but when such a combination is evaporated from a sponge we have no evidence that they remain combined in the form of vapor. On the contrary, the vapor is at first strongly impregnated with the odor of ether, and later on we lose nearly all trace of it. We should expect this result, since its specific gravity is nearly twice that of ether. If we derive any benefit by such a combination, it must be from the fact that alcohol retards the evaporation of the chloroform and insures a greater admixture of air. There must come a time, however, when the patient, already partially anæsthetized with ether, is inhaling nearly pure chloroform, and at a time when he is in no condition to endure its depressing influence. When taken alone, or in combination, its action is more rapid and less under our control than ether. Its powerful action upon the vaso-motor nerve-centres reduces the arterial blood-pressure to an alarming extent, and just here we may look, perhaps, for some clue by which we may trace back to a cause some of the sudden and mysterious deaths which investigation and post-mortems have given us no hint of the truth. If we will remember the relative position of the pneumogastric and vaso-motor centres, and also their many reflex connections with other centres, we can readily see why any injury to one is at once reflected to others.[1] "The blood contained in the veins is useless for the nutrition of the tissues. It is supplied and retained in the arteries, first, by fresh blood being pumped into them from the venous system; and secondly, by the contraction of the capillaries, which prevents it from passing too rapidly again to the veins. Any shock or injury, such as extraction of a tooth, will be reflected to both centres; and if the heart's action is thereby diminished or stopped temporarily, the same irritation will cause a contraction of the arterioles, thus retaining the blood and furnishing nourishment to the tissues until the action of the heart is resumed. In complete anæsthesia the reflex action of both nerves is abolished; but in partial anæsthesia the vaso-motor centre may become insensible

[1] "American System of Dentistry."

before the vagus, and any sufficient injury might stop the supply, while that in the arteries flows on to the venous side," where we find it always in case of shock and in the cadaver.

I wish to add, in relation to ether narcosis, I have observed that if inhaled in the early morning, while the stomach and its dependent nerves are in a state of perfect rest, we shall have less nausea; also if we use Squibb's ether and conduct our manipulations so as to reach perfect anæsthesia in the shortest possible time, the same good results will obtain. Just here you may say is a difficulty,—that of strangling our patient. But let us impress upon his mind and teach him the importance of breathing fully and deeply through his nose before we commence. One who has not tried it has no idea how kindly the nares and upper pharanx will take to its fumes, and of the agreeable sensation, when compared to that of inhaling by the mouth.

I have already taken too much of your time, but I have met with several cases in my practice, in which I took a very vivid interest, and after what I have written it might not be improper to give a brief account of the same.

Case I.—Male; age, thirty-five to forty. Temperament, nervous; habits, intemperate. Was treated for neuralgia in a palliative way, with morphia and chloral, for four months. At last his physician sent him to me to discover a cause, which was located in a closed, chronic alveolar abscess. After inhaling nitrous oxide a very short time, he suddenly showed marked symptoms of asphyxia; voluntary respiration ceased almost immediately, with pulse barely perceptible. Since the object was to remove the tooth, I did so, hoping to derive a benefit from the shock and accomplish the object also. (After deliberate thought, however, I cannot condemn my course in this respect too severely.) Applied Howard's method and succeeded, after a time, in restoring normal respiration.

Case II.—Male; age, twenty-five. Has no peculiarities. Temperament, phlegmonous. Ether was the anæsthetic, and result asphyxia, by the tongue falling upon the epiglottis. In this case much time was lost in trying to draw the tongue forward, which failed, owing to the titanic contraction of the facial muscles, until all voluntary respiration had ceased. I at last placed him upon his back, raising the thorax about six inches, allowing the head to rest upon the floor. In this case I used direct insufflation.

Case III.—Female; age, thirty-five. Temperament bilious, rather anæmic; had recently suffered both mentally and physically until the nervous system was somewhat reduced. Ether was administered

very cautiously. A condition of asphyxia followed, with entire loss of respiration. Heart's action very weak. Treatment same as Case II.

In studying these cases we discover two distinct conditions: Cases I. and III., respiratory failure; Case II., asphyxia from mechanical cause. I cannot say that the last medicine cured my patients or saved their lives, but I certainly know that their condition was very serious.

THE SEABURY VULCANIZER—A FEW CAUTIONARY SUGGESTIONS IN ITS USE.

BY WILLIAM H. TRUEMAN, D.D.S., PHILADELPHIA.

My purpose in writing is to relate, for the benefit of others, a little adverse experience in the use of the Seabury vulcanizer, I have had within the last few months from unexpected and unlooked-for causes, that might, with a machine less closely watched, have been disastrous; causes, however, readily avoided if the probability of their occurrence is known.

A few months ago, after several years' perfectly satisfactory experience with this machine, I was annoyed by plates being occasionally "under done," more frequently "over done," and in a few instances completely ruined by excessive heat. A steam-gauge that accurately indicated the pressure, and a very sensitive gas regulator that for some years has proved quite reliable, was, on examination, found to be in good condition, and should have rendered this quite impossible. All seemed in working order, and yet something was surely wrong. On taking the apparatus apart, the bent pipe connecting the gauge and regulator with the steam boiler was found almost completely closed with scale and rust, an exceedingly dangerous condition, indeed, one similar has been the cause of numerous disastrous steam-boiler explosions. The closure was not quite complete; under varying conditions the passage evidently was more or less open. At all times the gauge indicated steam pressure, but, owing to the obstruction, not accurately and not promptly. The condition of some plates showed plainly that the temperature of the vulcanizing chamber had been far in excess of that indicated by the recorded steam pressure. The fact that some plates came out properly vulcanized, and that others were under done, while the steam-gauge indicated the same pressure on each occasion, was sufficient evidence that this obstruction

was not constant; that it at times prevented the steam pressure from reaching the gauge promptly, while on other occasions, doubtless a passage had been opened, perhaps suddenly, actuating the regulator and partially shutting off the gas-supply; the obstruction afterwards acting as a valve, had held the gauge at that point until the heat in the vulcanizer had been considerably reduced, thus accounting for the under-done plates. This erratic behavior of the vulcanizer baffled all efforts to discover the cause for some time; indeed, it was not suspected until, satisfied that something was wrong, the machine was taken apart.

The cause of annoyance and danger may be avoided by occasionally inspecting this fitting; with a small pair of gas-fitter's tongs it can be readily removed. Other vulcanizers than the Seabury have a similar fitting, connecting to them a steam-gauge. It will be well for those who use them to bear in mind the possibility that this passage, usually of small diameter and purposely made tortuous to prevent the steam coming in direct contact with the interior of the gauge, and in use filled with water that is liable to be charged with agents that may corrode either iron or brass, may be thus closed and become a source of serious danger. In using the Seabury vulcanizer, see that the gauge promptly responds when steam is admitted to the vulcanizing chamber, or when the escape-cock is momentarily opened. Take no risks with any vulcanizer; they are all strongly made, and will bear a much greater pressure than the work requires; on that account an explosion from over-pressure is more dangerous.

There is another source of annoyance and possible danger to which I desire to call attention. The Seabury vulcanizer in use (and I presume most if not all two-chambered vulcanizers, or those using dry or superheated steam) has a separate heat-supply for the boiler or steam-generator and for the vulcanizing chamber. When gas is used, both are controlled by the same cock and the same heat-regulator, which in all vulcanizers I have seen fitted with one is actuated by the steam pressure in the boiler. I see no objection to this arrangement, neither can I suggest any change sufficiently free from complications for practical every-day use that would prevent the difficulty to which I now refer. With a free, unobstructed passage between the two chambers it would seem that the heat and pressure in each should be precisely the same,—the pressure undoubtedly is; the heat, however, I have found by costly experience, may be far greater in the vulcanizing chamber than accords with the pressure of steam in the boiler

This has occurred from two ascertained and preventable causes; there may be others as yet undiscovered.

First. It seems that when adding water to the boiler from time to time a little was spilled, and, running down the side of the boiler and across its bottom, dropped down exactly over the gas-burner of that side, and so corroded it that the gas-exit was reduced in size, and the gas flame thereby made much smaller than the one under the vulcanizing chamber. Be it understood that, in using the Seabury vulcanizer, when preparing to vulcanize, the cock controlling the passage between the two chambers is closed and kept closed until the steam-gauge indicates the desired pressure. The case is then placed in the vulcanizing chamber, the machine made steam-tight, and, lastly, the cock is opened admitting steam into the vulcanizing chamber. Both gas-jets are, however, in the beginning lighted at the same time, the intention being that, when the steam pressure in the boiler reaches the desired point, the other chamber shall be so heated that when steam is admitted to it it is not condensed. During the process of vulcanizing both jets are kept burning, it being presumed that, with an equal distribution of gas to each burner, the same amount of heat required to keep the steam in the boiler at the desired pressure will also keep the vulcanizing chamber at the required temperature. It seems to be essential to the proper working of the vulcanizer that within narrow limits the boiler and the vulcanizing chamber should each receive about the same amount of heat. The accidental corrosion of the burner under the boiler destroyed this equilibrium, and had resulted, before it was discovered, in the flame under the vulcanizing chamber, during the process of vulcanizing, being about twice as large as that under the boiler. When the gas was first lighted, as the two burners did not consume as much gas as would pass through the rubber tube connecting them with the gas-supply, the difference in the size of the flame was less noticeable than after the desired pressure was reached, and the gas-regulator, by partially closing the cock, reduced the gas pressure; the unobstructed burner then received much more than its share. The gas-regulator in use had for so long a time worked with such perfect satisfaction that the gas-jets were seldom inspected after they were lighted, and, consequently, this source of danger was for a long time unnoticed. Not until several plates were completely ruined by excessive heat was it discovered. Until then it was presumed that the steam-gauge indicated the precise temperature of both chambers, and that a greater degree of heat in either chamber than that corresponding

to the indicated steam pressure could not be. The excessive heat to the flask and its contents was not due to direct contact with the bottom of the chamber, the flask in all cases being supported by a casting ring, and not in contact with the bottom or the walls of the chamber at any point.

Much the same condition of affairs may result if the vulcanizer leaks steam. More heat will then be required to keep up the steam pressure, and unless each source of heat is separately controlled, an arrangement not to be recommended, excessive heat will be communicated to the vulcanizing chamber and the work correspondingly impaired. Injury to the work is, however, the least important consideration. All heat applied to a vulcanizer, unregistered and unrecorded, is a serious source of danger. A broken thermometer, an unreliable steam-gauge or gas-regulator, the heat absorbed by dry steam, and that does not increase the pressure and thereby effect the steam-gauge, increases the risk attending this operation. If this excessive latent heat does not increase the pressure, it decreases rapidly the tenacity of the metal, and thereby weakens the walls of the vulcanizer. Or again, if from any cause a few drops of water should pass from the boiler into this superheated vulcanizing chamber, a mishap liable to occur from various causes, a destructive explosion would be inevitable.

In conclusion, this experience seems to teach that an excellent form of vulcanizer, fitted with perfectly reliable regulating and safety appliances, should be at all times, and at all points, closely watched and inspected, and occasionally overhauled.

Notwithstanding the unpleasant experience above related, so satisfactory has been our seven years' practical use of the Seabury vulcanizer that I would not willingly go back to the older form. We have found it so much more cleanly to use, so much more convenient for both packing and vulcanizing, and the resulting plates so solid and uniform in texture, that we can readily excuse this, the first trouble we have had with it, especially so since the cause being known it is not likely to again occur.

Reports of Society Meetings.

AMERICAN ACADEMY OF DENTAL SCIENCE.

The regular monthly meeting of the American Academy of Dental Science was held at the Boston Medical Library Association rooms on Wednesday, March 2, 1892, at 7.30 P.M., President Brackett in the chair.

The paper of the evening was by Dr. Louis Jack. Subject, "The Fixation of Dental Matrices and the Packing of the Cervical Portion of the Cavities."

(For Dr. Jack's paper, see page 565.)

DISCUSSION.

Dr. Meriam.—There are many of our younger members who ought to know that to Dr. Jack we owe the matrix. After Dr. Jack made it known, not much was heard of it till about five or eight years ago. It then gained prominence, perhaps on account of Dr. Herbst's methods, and our shops and our offices were flooded with many forms of this device. Dr. Jack presented the matrix to the profession without patenting it (it was the trading element that did that later), and it is to him we owe it as a professional instrument. You can see by the paper to-night that the fixation of the matrix requires care and precision. In the hands of Dr. Jack the matrix reduces the filling of teeth almost to an exact science, but the probability is that it saves little time except in the finishing.

Dr. Fillebrown.—I learned the art of filling teeth without the use of the matrix, and I have been inclined to operate without it ever since. I have, however, used the matrix enough to know that it is a very valuable help in many cavities. It needs to be used with a good deal of discretion and care. The matrix must be considered as an important wall of the cavity, and the filling must be as carefully adapted to it as to the other walls. Unless you do, the filling is soft at the cervix and imperfect at the margins. We have found it a difficult thing to get students to use the matrix with skill. While the matrix that was invented by Dr. Jack and presented here to-night in connection with this paper is a valuable device, there are various improved forms in use to-day, and among

them might be mentioned the Ladmore-Brunton. This is a steel band which encircles the tooth. The steel is thin enough to go between teeth that are very close together. The band is tightened around the tooth by means of screws.

Dr. Taft.—I have found the matrix especially valuable in compound fillings. The one I use is made of silvered copper. It is secured in place by a ligature passed through two holes punched through either end.

President Brackett.—Dr. Jack is not confined to the use of a matrix in the filling of corono-approximal cavities. This is one of his resources.

Dr. Ainsworth.—I never think of filling an approximal cavity in a bicuspid or molar, where the coronal portion is involved, without a matrix. After investigating all forms of matrices, I now use thin cold-rolled steel, which can be bent, and yet retain, to a certain degree, its elasticity. The Perry separator is an excellent device for holding a matrix is position. A piece of orange-wood can be adjusted at the cervical wall. To my mind, the matrix saves time not only in finishing, but all through the operation. It also enables one to build up a bicuspid badly gone on both mesial and distal sides, and for this purpose a band of German silver completely encircling the tooth is very convenient. It can be held in position by packing cement on both sides.

I have never taken up combination fillings of gold and amalgam, because with the matrix I can use soft foil quite as rapidly as amalgam, and with more satisfactory results. And it is very rare for fillings so made to give out.

Dr. Taft.—I cannot quite agree with Dr. Ainsworth that soft foil can be used as rapidly as amalgam in the cavities under consideration. As to matrices, silvered copper has a decided advantage for me, in that it lights up the cavity.

Dr. H. A. Baker.—I have probably used the matrix as much as any man in New England. I was the first one in New England to adopt it after Dr. Jack made it known, and I was also the first one to introduce the copper matrix, and then the silvered copper. I am using at present a thin steel matrix, and the Perry separator for fixing it.

Dr. Wilson.—I would like to ask Dr. Baker if he uses an absolutely soft gold with the matrix—a gold that cannot be made cohesive?

Dr. Baker.—I am now using an unannealed cohesive gold number three foil.

Dr. Meriam.—In England they usually speak of such gold as ale gold. It seemed a good word to adopt in distinguishing it om absolutely non-cohesive gold.

Dr. Adams.—There is one use of the matrix which has given e a great deal of satisfaction, and that is in very large buccal avities in the lower molars which are to be filled with amalgam. uch cavities extending below the gum are very difficult to treat. use a matrix of thin steel, concaving it with a round-faced ham- er on a block of lead, then bending it around the tooth and tying ith ligatures. This matrix is applied before the cavity is exca- ated, and after it is applied the rubber dam is adjusted. The atrix fits closely to the tooth and becomes a guide in excavating, nd, if properly fitted, excludes all moisture.

Dr. H. A. Baker.—Have you filled such cavities where they xtend beneath the gum?

Dr. Adams.—Yes. I do not use the matrix unless the cavity oes go beneath the gum. I can carry the matrix down to the furcation of the roots, and it is a great assistance in excavating. Vith amalgam, of course, a very thin steel can be used, because here is not much pressure. The holes in the matrix are made quite w down, and the ligature is wound several times around the tooth.

Dr. Meriam.—The ring steel matrix can be used with great ad- ntage in the case of badly-decayed molars requiring the restora- on of more than one surface. The steel can be fitted as a ring, nd soldered and left in the mouth until an amalgam filling has rdened. There is no more difficulty in soldering cold rolled steel an in soldering German silver.

Dr. Adams.—I wish to present a cast showing the cuspid uated between the two bicuspids.

Dr. Ainsworth.—I have been trying, to a limited extent, the ethod about which Dr. Clapp spoke at one of our meetings, of de- nding upon cement to retain gold in cavities where it is difficult gain an undercut. I think highly of the method, and have been le to make several fillings which have seemed entirely satisfactory.

Dr. Robinson.—Just after Dr. Clapp mentioned the method luded to I tried it in mesial cavities in bicuspids and molars, and o in frail centrals, and the results have been very satisfactory.

Dr. Williams.—Several years ago Dr. Buckland advocated a mbination of cement and amalgam in cavities with frail walls. I d this principle, and from it the idea came to me of embedding ystal gold in cement while soft, and thus gaining a foundation for gold filling.

Dr. Fillebrown.—More than twenty years ago cavities whicl were so large and with such small undercuts that it was useless t(think of putting gold-foil in them I filled with oxychloride an(allowed it to harden, and then cut grooves in it and filled over i with gold; such fillings did good service for many years.

Dr. Meriam.—It is about fifteen years since Dr. Kidder read a paper advocating the use of Canada balsam in connection witl Watts's crystal gold for starting a filling.

President Brackett.—I had a case of a cavity in a lower incisor involving the cutting-edge and distal surface. The extremely frai walls of the cavity rendered it impossible to make suitable retainin(cuts, and I tried this method of putting Steurer's gold into sof cement and building on that as a foundation. The filling was com pleted, but inadvertently left prominent, so that for a week it wa subjected to the extra strain of undue occlusion; yet it was no displaced. Since dressing it to proper contour several weeks hav passed and it has remained absolutely undisturbed.

Dr. Eddy.—There is a preparation of gold made by the S. S White Dental Manufacturing Company similar to Steurer's gold but not as friable. It comes in small mats, and there is not s(much waste as with Steurer's.

President Brackett.—If there is no objection, we come to Dr Stoddard's presentation of a new dental lamp-fixture.

Dr. Stoddard.—I have been using this electric lamp for the pas two or three months with considerable satisfaction. It is intende(to be attached to an Allen table, and the wires can be easily con nected with an ordinary electric-light socket. The fixture i pivoted to this brass plate, which is screwed on to the under par of the table. It can be moved forward or backward, and is easil adjusted. Vertical motion is supplied by the bracket. When it i not in use, it can be turned around out of the way. I use a sixtee candle-power Edison lamp, which is rather stronger than the S. S White lamp, which, I believe, is but five candle-power. The lam is cylindrical in form, and the shade is similar to the pulpit shad and is perfectly adjustable. There is comparatively little hea from the light.

President Brackett.—I have seen this lamp in use, and it certainl seems a very efficient illuminant and free from the many objec tions to gas.

WILLIAM H. POTTER, D.M.D.,
Editor American Academy of Dental Science.

CONNECTICUT VALLEY DENTAL SOCIETY.

DISCUSSION OF DR. BUCK'S PAPER ON GENERAL ANÆSTHESIA.

(For Dr. Buck's paper, see page 578.)

Dr. Rider.—I would like to ask Dr. Buck, as he has spoken of the ow temperature, is it not a favorable symptom? Also, what is his uthority for saying that oxygen is lost from the nitrous oxide in ts administration?

Dr. Buck.—My answer to the first question is, I think it is; and o the second, I do not remember. My experience is that we ave the same symptoms with nitrous oxide as with carbonic acid as. One is as poisonous as the other. Of the two, I prefer to ive ether.

Dr. Lovejoy.—This is an exhaustive subject, and the only way to roperly discuss it is to have copies of the paper put into the hands f able men before the meeting. No one anæsthetic is the best in ll cases. There is a great deal said against chloroform, but it is very atisfactory in some places; a few drops combined with the nitrous xide is of great advantage. I know some surgeons will not have nything to do with it, but in Germany and the South it is prefer- ble to other anæsthetics. I administer it when it is about the nly thing that can be used. Children sometimes will not take the as, and then chloroform can be used. It acts quickly. This is a ubject of great interest to dentists.

Dr. Rider.—One thing to be said in favor of nitrous oxide is, it the safest anæsthetic in the hands of the incompetent: in their gnorance the symptoms become so alarming before the actual anger-point is reached, that it frightens them and saves the atient. I think this is the reason there has been so little trouble ith it in the hands of the ignorant practitioner.

Dr. Morgan.—One word that has been dropped I wish to speak f, and that is death. In the discussion of anæsthetics and its tendant symptoms, we are constantly reminded of this one upreme danger, the death of a patient in our chair. I would like o inquire if we do not mistake in this matter. It is certainly a rious thing to have a death in our office; but so far as the patient concerned, is it not possible that it is preferable to the continued e with the train of evils induced by the anæsthetic,—practically living death? I make this mention because I feel that health ould be as sacred to us in these cases as life.

Dr. McManus.—Years ago I saw chloroform and ether admin istered a great many times in the most simple way. I never saw a bad case. It is very unfortunate that there is so much conflict o opinion among surgeons. Every one admits chloroform has mor deaths than other anæsthetics; ether, next to gas, the least of all The point Dr. Morgan makes is a good one. The deaths fron chloroform have mainly occurred in hospitals and upon case when not in good condition. Many occur before any operation ha been performed. This seems to show that the operator shoul know his patient before administering anything. Patients attribut ill results to the anæsthetic when it may not be that at all. A surgeon generally prepares his patient before giving the anæsthetic dentists do not.

Dr. Maxfield.—There is much weight to the remarks of Dr Morgan. While it is an admitted fact that at the time of administra tion there are more deaths when chloroform is used than whe ether, yet, if we could know all the lesions that are the resul from ether, such as renal troubles, etc., I am inclined to think w could class ether as dangerous as chloroform. I believe that, in th near future, pathologists will be able to throw much light on thi subject. We must admit that nitrous oxide is the safest of a anæsthetics. Its extensive use by so many unprincipled and ignc rant men, and the few accidents that occur, demonstrate this. Ur doubtedly a great many after-troubles can be traced back to th gas, as the inciting cause, for I do not believe the normal function can be so interrupted, as they are when an anæsthetic is admir istered, without causing lesions. One thing we should always bea in mind, whenever we are administering an anæsthetic, and that i we are carrying the patient as near death as possible, yet keep hir alive. It is a great risk, and one I do not like to take. I alway feel a relief when the patient "comes to," whether it is gas or ethe I have given.

Dr. F. E. Nims.—I do not believe in the use of paper cones, tea cups, and like appliances to force the patient in taking ether, for frightens the patient and induces strangling, coughing, etc. prefer to use a towel folded as it comes from the laundry, an placing the upper part close to the face under the eyes, and the pouring on small quantities of ether at short intervals, doing th as the patient exhales. I do not feel, as some who have spoken, tha danger does not exist when using nitrous oxide. I had a case not lon ago, of syncope after extraction with nitrous oxide, which, to sa the least, was very unpleasant. Only a few weeks ago a man die

while sitting in a barber's chair in Fitchburg. Had he come to me and I had given him nitrous oxide, it would have had the credit of causing his death. We do not know what conditions patients may be in when they come to us and request us to administer an anæsthetic.

Dr. A. J. Nims.—After an experience of over fifteen years in the use of ether and nitrous oxide, and from a close study of the experiments and investigations of those who are the best authority on these agents, I have reached the conclusion that ether is as safe as nitrous oxide. The administrator should have a technical knowledge, experience, and good common sense. Many unpleasant experiences with ether are caused by the bungling manner in which it is given. Many physicians exhibit poor judgment in handling it. The strong point with ether is that by observing the symptoms, serious trouble may be averted. In the use of nitrous oxide some men attempt extensive operations and administer too much gas, and thus almost produce asphyxia, and also, perhaps, having a little chloroform introduced into the vapor. It is in such cases as these you get those living deaths spoken of by Dr. Morgan. I have talked with a number of people who have taken gas under these conditions, and they have remarked that nothing would induce them to take gas again in those offices.

Dr. McManus.—In talking with Dr. Atkinson some years ago he made a remark that he thought a great deal of the nervous trouble here met with was the result of administering an anæsthetic to the mother at time of childbirth. We know that the majority of nervous troubles occur among the well-to-do people, those who can afford to have every attention. Among the poor they have to get along without this luxury.

Dr. Maxfield.—It is a fact that with children and with women in time of labor, chloroform acts differently; that is, it is as safe as any anæsthetic. What Dr. McManus has just remarked is being recognized by the more intelligent physicians, and anæsthetics are not given at time of childbirth as often as a few years ago. Only a little chloroform or ether is used, just enough to cause a slight benumbing effect, not enough to put the mother to sleep or to approach unconsciousness. Only a short time ago a physician remarked in regard to two of my patients,—a brother and sister,—that he thought the cause of their being so nervous was the result of the anæsthetic used at the time of their birth.

THE POST-GRADUATE DENTAL ASSOCIATION OF THE UNITED STATES.

THE Third Annual Meeting of the Post-Graduate Dental Association of the United States was held in Chicago, Friday and Saturday, April 29 and 30.

The first day was devoted to clinics, which were given at the Chicago College of Dental Surgery. These proved to be a very interesting part of the programme, and consisted of,—

Experiments with Anæsthetics upon the Lower Animals by Dr. W. C. Barrett, of Buffalo, New York. Dr. Barrett held the rapt attention of a large number of the members for several hours. His demonstrations of the actions of nitrous oxide were especially interesting.

Dr. James A. Swasey, of Chicago, inserted a gold inlay filling in an incredibly short space of time. In the words of the doctor, "It is worth something to know how to do this, in order that we may save time and pain and discomfort for our patients."

One of the features of the day was the exhibition of regulating appliances by Dr. Angle, of Minneapolis, Minnesota. These were shown with explanations and demonstrations regarding their construction.

Dr. H. C. West, of Chicago, demonstrated his method of root-filling.

Dr. J. A. Dunn, of Chicago, demonstrated his treatment of abscesses with fistulous opening, exhibiting special appliances.

In the evening a meeting was held, to which a general invitation was extended to the dentists of Chicago. The speaker of the evening was Dr. W. C. Barrett, who entertained the meeting in his usual brilliant manner. The meeting was also addressed by Drs. Brophy, Ottofy, and Clifford, of Chicago; Drs. Angle and Martindale, of Minneapolis, Minnesota; and Dr. Owen, of Broadhead, Wisconsin. In behalf of the management, Dr. Ottofy outlined in brief the course of home study as proposed, and which will be open early in the summer.

SECOND DAY.

The meeting called to order at the Leland Hotel at 10 A.M.

The president presented his annual address, recapitulating the work that had been accomplished this year. While to those who had not been in intimate contact with the work little advancement might seem to have been made, yet it was shown that much

of importance had been done; that we were a long way in advance of last year, with a system of home study almost ready to put into operation; and that an earnest and widespread interest had been developed among many of the best dentists of the country as well as all along the rank and and file generally.

Dr. Tuller made several suggestions for the future, which were discussed, among them a suggestion as to what part we would take in the Columbian Dental Congress next year, recognizing that owing to our youth and incompleted plans of work we could not take any important part. The appointment of a committee to investigate and suggest plans, and ways and means, was left to the president. The presentation of models, appliances, and incidents of office practice gave rise to animated discussion, which brought out many new and valuable ideas.

Dr. Nicholson, of Wisconsin, presented a model of a very interesting and difficult case of irregularity which he had successfully handled.

Dr. Julian, of Indiana, presented a difficult piece of crown- and bridge-work.

Dr. Owen, of Wisconsin, illustrated a method he had used to correct a faulty occlusion, which was highly appreciated.

Dr. Tenny gave demonstrations of the most advantageous positions to occupy in performing difficult operations.

Dr. Ottofy followed in the same strain, demonstrating the many advantages of a position at the left of the chair. But it was observed that Dr. Ottofy had a special faculty in such cases in that he could use his left hand with almost equal facility with the right.

Dr. Tuller claimed that this could be attained by almost any one, particularly the young, if diligent effort were made, and thought our colleges and teachers should impress and even enforce it upon students, insisting that in many operations the handling of instruments should be done with the left as well as the right hand, making them thereby better manipulators and more skilful dentists.

Dr. Fahr, of Wisconsin, presented diagrams and models, showing a method he had adopted in restoring abraded molars, employing screw anchorages, and building up with platinum and gold.

The meeting this year was called two months earlier than last to correspond with the change made by the Chicago College of Dental Surgery in holding its practitioners' course, and as the charter, as adopted at the last meeting, does not permit the elec-

tion of officers until the end of the year, this order of business was suspended, and the meeting adjourned subject to the call of the president and secretary. A meeting will probably be called during the latter part of June.

Officers.—President, R. B. Tuller, 946 Madison Street, Chicago. Vice-Presidents, L. S. Keagle, Vinton, Iowa; A. P. Nicholson, Edgerton, Wis.; M. R. Julian, La Fayette, Ind. Secretary and Treasurer, L. S. Tenney, 241 Wabash Avenue, Chicago. Manager, Louis Ottofy, 1220 Masonic Temple, Chicago.

Address all communications to the Post-Graduate Association, 1220 Masonic Temple, Chicago.

Editorial.

WHERE SHALL THE LINE BE DRAWN?

A QUESTION of some importance, viewed from a professional standpoint, is that of the admission of proprietary advertisements to the pages of dental and medical journals.

It is a recognized axiom of medical ethics that it is derogatory to professional character for a physician to hold a patent for any surgical instrument or medicine, or to dispense a *secret nostrum*, whether it be the composition or exclusive property of himself or of others. Carry this law to its legitimate conclusion, and it must be equally a violation of the code for medical journals to receive and print advertisements of the character condemned. Yet there is probably not a medical or dental journal published that does not admit advertisements open to criticism.

We quote abstracts upon another page from a paper read by Dr. S. Solis-Cohen before the Philadelphia County Medical Society, and also portions of the able rejoinder from the pen of the editor of the *Journal of the American Medical Association.*

That part of this answer devoted to the financial side of the question, while forcibly stated, is necessarily weak, in that it defends the practice on the ground of necessity. The retort may safely be made, "If journals cannot be supported free from the taint of connivance with empiricism, then better no journals," and it is presumed that if this course were adopted the majority of professional periodicals would cease to exist.

The question naturally follows, If advertisements be necessary to the life of a journal, can they be so prepared that they will not impinge upon any code of ethics, dental or medical?

In considering this subject in its entirety, it is obvious that it should not be met by a narrow interpretation of the code on the one hand, or a too liberal rendering on the other. The question of finance should, it seems to us, be left out altogether. However important this may be, we are not prepared to believe that a professional journal may not be carried on without the aid of questionable pecuniary methods. It is recognized that before this can be accomplished an entire change will be necessary in professional sentiment, but to assert its impossibility is to acknowledge an entire absence of professional spirit. The latter exists more pronounced, we judge, in medical than in dental circles, yet, in degree, latent in both, and may need a professional convulsion to bring it into activity. The indifference manifested in the financial success of journals devoted to professional work is well known, and requires no extended illustration. It seems to be taken for granted that they are not subject to the ordinary laws of business, but have a life superior to the traffic in dollars. It is the business of every man connected with a profession to be interested in the journals published for its benefit, and to know something of the efforts made to meet the current demands against it. If each were to assume a share of this financial responsibility, it would not be long before these periodicals would be above the necessity of depending upon outside help for their existence. Until this is accomplished the keen edge of criticism could be turned with advantage towards the profession.

Admitting that medical and dental journalism has not reached its millenial stage, and must, for a long time in the future, accept the patronage of those who deal in supplies, is it not proper to consider where the line may be drawn, so that the journal may not be lowered in its professional standard.

The fact does not seem to be recognized with sufficient force, that methods of manufacture have been so improved in the past half-century, and especially in the last decade, that remedies are placed to-day in the hands of the practitioner in a form and with a degree of perfection not heretofore possible of attainment. It requires no argument to prove that private hands are not equal to the perfection of combination accomplished by capital.

When Dr. S. Solis-Cohen classes an entire series of valuable preparations with the recognized empiric remedies, it seems to us he

does an injustice not only to the manufacturer, but to the medical practitioner. To our comprehension the active agent placed on the market in a form pleasant to patient and satisfactory to the dispenser, and with the stamp of a responsible firm as proof of chemical purity, is preferable to adulteration made possible through the ordinary channels.

The medical side of the question does not interest us as much as that of the dental, but both are so intermingled that it is difficult, if not impossible, to separate them.

Dentistry has from its earliest beginning been subject to the overpowering influence of trade. The amalgams, plastics, and even the gold used, has been prepared for us by processes unknown. To this day no one, as far as we are aware, has given the process of preparing true non-cohesive gold. When amalgams were first introduced, each individual manufactured his own, and the result was that they were denounced and men read out of the profession for using them. Not until the manufacture was conducted on a large scale, and attention paid to chemical purity of metals, could these be used as now to the mutual advantage of patient and operator. The same is true of oxy-phosphate and oxy-chloride of zinc, and also of gutta-percha. The processes of preparation of these are secret, and their manufacture holds the same relation to dentistry as those mentioned by Dr. Solis-Cohen do to medicine.

To our way of thinking, responsible houses in both medicine and dentistry have performed a most valuable service in producing preparations impossible of accomplisment by the individual. While this is stated, we recognize the fact that these houses are in duty bound to give to the professions the agents used in the combinations. If this is not done, they must be relegated to that other class with whom no respectable journal can fraternize.

The individual who brings together, in a secret formula, a series of well-known ingredients and advertises the result as a specific, is an empiric of formidable proportions. They present themselves prominently as "obtunders of sensitive dentine for extraction locally without pain," and in washes and tooth-powders. Between these and the first-named, it seems to us, a line, and a very wide one, should be drawn. The latter should have no place in a well-regulated journal, while the former should not only be there, but, as is clearly stated by the editor of the organ of the American Medical Association, practitioners "can by their use present their patrons much more elegant specimens of pharmaceutical work," and we can add dental preparations.

What is needed in considering this question is to understand that we are in the beginning, apparently, of a period when the individual is to be submerged in the body of workers, and that this will apply in the near future to all the relations of professional and business life. To fight against this tendency seems an unprofitable contention, if indeed it may not be a direct blow to professional progress.

CHARGES FOR PROFESSIONAL SERVICE.

The amount charged for services is one of the most important factors that help to make or mar the fortunes of the modern practitioner of dentistry. This is especially the case with the beginner. Let him be ever so neat, gentlemanly, and thorough in his work, and charge four or five dollars an hour, he will spend most of his time idly, sighing for the patients that never come. While across the way he may see an untidy person constantly busy over an ever-increasing crowd of patients.

The cause of this most unfortunate state of affairs is only too evident. The experienced dentist is not paid merely for excavating a tooth, or for materials placed therein. This fee remunerates for skill, for delicacy of manipulation, for the perfect confidence which he inspires in his patient, and for many other desirable qualities which years of practice alone can give.

If this be true, the failure of the beginner to build up a practice while charging the same price as the older dentist is only what might be expected. Until he has a certain amount of experience outside of the dental college he should keep the fees reduced to such a point that patients will come to him in numbers.

One of the most successful practitioners of Philadelphia, in speaking of his early professional life, said, "I made it a rule to be always busy. If I could not fill my time at two dollars an hour, I charged one dollar. If one dollar could not be paid, rather than be idle I worked simply for the cost of the materials. Thus, my hand gained skill, my experience enlarged, and the number of my patients increased. True, the low-priced patients, in themselves, did not bring much money, but often, very often, they were the means of sending me their friends, who paid liberally."

The man whose practice consists of a few rich families, charged exorbitantly, occupies a humiliating position, as he is necessarily entirely dependent upon them for his material existence.

A dentist to be independent should have a practice so large that the loss of three or four of his most wealthy patients should be a matter of little moment. To bring about this desirable state of affairs he should be sure to give a liberal return for money received.

But, it has been said by beginners, "If we start with our prices too low, how shall we be able to raise them?"

The answer to this is clear and simple.

If a dentist has eight hundred patients, all of whom pay two dollars an hour for services, he can first raise the prices to newcomers, and later, as confidence in his position is established, he can extend the advance throughout the entire practice.

Many established practitioners regard low prices in beginners as a fault, as an attempt to undermine the average scale supposed to be charged by the profession at large. Guided by their protests, many a conscientious beginner fails to collect a practice, where one without regard for dental ethics succeeds.

A professional man is paid quite as much for the manner of performing the work as for the work itself. Leading actors like Booth or Jefferson are not disturbed because large numbers of professionals work for a small sum nightly. This fact in no wise jeopardizes their large incomes. So long as their work maintains its high excellence they need not fear competition.

There are hundreds of teeth extracted to-day because the people cannot afford to pay the ordinary charges. This is so much work lost to the profession at large, so much actual money thrown away, so much benefit taken from the community. There are many graduates who would willingly perform this labor for very moderate prices if they could get it. But they are too apt to drive it away by indiscretion.

Almost the first questions a young practitioner asks is, "What shall I charge? What do you charge?" These two questions many times have caused him years of sorrow and hopeless longing for the clientele that never comes.

If he had commenced with the idea of doing a great deal of work for a little money, his skill would have increased, his experience enlarged, his reputation spread. Patients would have flocked to him as to the one person whom they would permit to fill their teeth, and then, independent of the whims or idiosyncrasies of the few, he could have charged fair prices with a feeling of security in the rapid development of his reputation and the enlargement of his bank account.

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THE FINAL ACTION ON THE WILCOX BILL.

We published in our last issue a full report of the action of the two committees of the Maryland State Dental Society and the Odontological Society of Pennsylvania in connection with this bill, now before the Senate, it having passed the House of Representatives. The joint committee had an interview with the members of the Senate committee, of which the Hon. Eugene Hale is chairman. The subject was fully discussed and the justice of the claims of the dentists conceded, but the Superintendent of the Census, Hon. Robert T. Porter, objected to the following amendment to the bill proposed by the committee:

"*Provided that nothing in this act shall be construed as authority to collect statistics from professional men, such as lawyers, physicians, and dentists.*" The objection was founded on the fact that the bill was primarily intended to meet difficulties in which dentists were not involved, and should it go back to the House its final passage would be endangered.

The following decision was finally reached: That if the committee would waive further objection to the bill as at present framed, Superintendent Porter should state in writing, in the presence of the Senate committee, the course he proposed to follow. We append a copy of the agreement.

WASHINGTON, D. C., June 27, 1892.

The Superintendent of Census agrees with the representatives of the dental associations present at a meeting of the Senate Committee on the Census, to carry out the spirit and purpose of the amendment presented by the said associations at the meeting, and which appears in the paper marked "A," herewith attached.

(Signed) ROBERT P. PORTER,
Superintendent of Census.

Dentists throughout the country will henceforth know how to act when called upon by the agents.

The joint committee deserve, and will, we are sure, receive the thanks of the profession for the prompt and successful completion of this difficult work.

DENTAL LAW IN THE DISTRICT OF COLUMBIA.

We congratulate the members of the dental profession in the District of Columbia, that, after years of effort, they have succeeded in securing from Congress a law regulating practice in dentistry.

Charlatanry was more rampant there from the fact that all the surrounding States have had laws, while this small section of government land has been left to the tender mercy of the national legislature. The difficulty of moving so large a body can be appreciated, but, at last, it has been accomplished.

The men who have the control as a Board of Examiners can be depended on to carry out its provisions with vigor and justice.

We desire to express special congratulations that a sensible law has been enacted. The framers have recognized in it that colleges have some rights, and refused to be tempted by the cry of *re-examination.* The law says "all graduates of dental colleges which require a three years' course of study shall be entitled to certificates upon payment of the certificate fee, and *without examination* as to their qualifications." We trust that this reasonable clause may carry force and influence into regions less liberal, and lead to a change of law to a more fraternal basis.

DR. BARRETT'S STATEMENT.

We have neither the space nor desire to reply to the answer of Dr. Barrett to our editorial in the last number. The article in question was intended to be general in its application, and made no allusion by name to the University of Buffalo.

We must correct our correspondent in one particular. He states, "I made an attack upon the practice of granting the regular degree of the schools *sine curriculo*, upon a mere examination, and the outcome of the matter was the formation of the National Association of Dental Faculties."

Valuable as the influence of the *Independent Practitioner* was, the origin of the association named was based on a desire to organize the colleges for better government. Upon the call of four deans of colleges the original meeting was held.

We have permitted Dr. Barrett to be heard in defence, but it must be understood that the pages of this journal are not open to continue a local controversy.

DARTMOUTH COLLEGE HONORS—DR. R. R. ANDREWS.

THE honorary degree of Master of Arts (A.M.) was conferred on Dr. Andrews by Dartmouth College at the commencement, June 3, in recognition of his "work in microscopy and dental histology."

The dental profession so thoroughly appreciates the results of Dr. Andrews's labor, that the feeling will be universal that it is an honor nobly earned and justly given.

Universities and colleges, where they refuse to grant honorary professional degrees, still adhere to the old custom of conferring the degrees of Master of Arts, Doctor of Divinity, and Doctor of Laws upon "strangers of distinguished reputation," and in recognition of advanced work. This will, probably, be continued for an indefinite period.

Domestic Correspondence.

STATEMENT OF DR. BARRETT.

BUFFALO, N. Y., July 13, 1892.

TO THE EDITOR OF THE INTERNATIONAL DENTAL JOURNAL:

In the July number of your valuable journal there is an article which, it seems to me, in the endeavor to establish a wholesome principle, places New York educational affairs in a wrong light, and does an unwarranted injury to an old and honored institution. There are a number of reasons which impel me, very much against my will, to indite an answer to it. Error travels faster than truth, and unless the latter starts early she will scarcely keep in sight.

The criticism is directed against my Alma Mater, a university of almost fifty years' standing, which was founded by Austin Flint, Sr., Frank Hamilton, John C. Dalton, and James P. White, and which has always occupied the same high plane upon which they placed it. The University has for years honored me with a place in its Faculty, and loyalty to her demands that I should not cravenly hold my speech when her good name is assailed, through a misapprehension of the real condition.

For years the University had been desirous of establishing a department of dentistry, that her medical teaching might be com-

plete in all its branches. The lack of room has always acted as bar to the accomplishment of this; but when the new Universit buildings were perfected, the architect was instructed to includ the necessary space.

At the late commencement, the Council unanimously voted t establish the department, and elected four men to form the gov erning board, and to organize the school upon the same principle under which the other departments were in operation. To signal ize the event, to indicate its good will towards dentistry, and t furnish the profession the highest mark of its appreciation, it con ferred the honorary degree of Doctor of Dental Surgery upon tw men who have for many years been foremost in the work of denta reform and progress, and concerning whose qualifications there ca be no question. One of them has for sixteen years been a membe of the Dental Examining Board of the State of New York, and fo a number of years its president. The other has for nearly a quar ter of a century been in a most reputable practice, a leading denta society man, and the peer of any dentist in the State. As an oper ator his name stands at the head in western New York.

It is not the fact that the degrees were conferred for the purpos of qualifying them for a position in the Faculty, for both already held the State degree, which, by the peculiar enactments of ou Legislature, is the highest qualification that any man can hold in th State of New York. Even this was not necessary to a position i the Faculty. No degree is essential to a professorship in any denta or medical college in any State. The signature on a diploma of a professor who holds no degree whatever is equally good with tha of the man who has all that every school can offer.

There is no legislation forbidding the granting of honorary de grees in dentistry. The schools represented in the National Asso sociation of Dental Faculties voluntarily agreed between them selves that they would not confer it without the consent of a majority of those represented, but that is far from being an inter diction of the degree. The University of Buffalo owes no allegianc to that body, as yet. When its dental department becomes a member, it will be governed by its rules and regulations, and wil sustain them to the best of its ability. In the late instance th University conferred the honorary degrees in perfect good faith and without the slightest thought of doing anything that woul subject itself to criticism.

Nor would the question have been raised in this case any mor than it has in the numerous instances that have occurred in the past

had it not been for a misconception of the situation by the local opposition, without which no college ever was established. There is scarcely a school that has not upon its Faculty men who hold honorary degrees, and in some they make up a large proportion of the teaching force. If Buffalo is to be censured for this, there is not a school in existence which will not lie under the same disability, for the late degrees were not conferred in the face of any legislation to the contrary, and the status of its teachers is precisely that of the other institutions. There has never, to my knowledge, been any expression in any competent dental body of any hostility to this form of diploma.

Honorary degrees have been recognized in all ages and by all schools. The English universities grant them, and distinguished clergymen, and other professional men, may be found in all countries, who are proud of the D.C.L. conferred by the old world universities. Eminent teachers feel honored at the reception of the LL.D. Our own universities confer the D.D. upon teachers and others, and the M.D. upon many men not in medical practice. The D.D.S. has perhaps been showered too freely by our young schools, but the degree itself is young, and the position of those who have received it has never yet been questioned.

Was the deceased Edward Maynard, of Washington, held in less repute because all of his numerous degrees were honorary? Was the late James W. White ever called to account because, in recognition of his eminent attainments, the Pennsylvania College of Dental Surgery conferred upon him the honorary degree of D.D.S., and a New York university that of M.A.? Good old Dartmouth has lately given to Dr. R. R. Andrews, of Cambridge, the honorary degree of M.A. Is there a dentist worthy the name who does not feel reflected upon himself a little of the distribution so worthily bestowed? It is an honor to the whole profession, and should be so considered. Will the INTERNATIONAL DENTAL JOURNAL proceed to call that school to account for it? Michigan University conferred the honorary degree of Ph.D. upon W. D. Miller. Does the JOURNAL propose to censure that school for this act, or for granting the degrees of M.D. or D.D.S. to honored dentists? If every eminent man who holds an honorary degree in dentistry is to be cast out therefor, it will be a lonesome time for the comparatively few remaining, for the highest have been singled out for this distinction. Until some legislation by some competent professional body forbids the granting of degrees of honor by the universities, which too often are beyond their jurisdiction, all the honorary diplomas are

alike, and there can be no preference shown to any, whether early or late.

Personally, I have been opposed to the practice which has been followed by schools in all ages. So far as I know, I am the only man who has publicly placed himself on record against degrees not in course. But until all the schools accept my views and agree to be governed by my dictation, they are not to be censured for doing the things which I may individually condemn. It is barely possible that there may be nothing criminal in acts which do not meet my personal approval. The colleges, at any rate, are not more responsible for my utterances than I am for their proceedings. I shall do all that I can to bring about the reforms which I deem advisable, but until some united action can be induced I shall recognize the present condition, and shall not proclaim war against everything that now is. I propose to live in this world for a while longer, and if I do so I must conform to what others deem best, and not demand my own way in all things.

Some years since, when editor of the *Independent Practitioner*, I made an attack upon the practice of granting the regular degree of the schools *sine curriculo*, upon a mere examination, and the outcome of the matter was the formation of the National Association of Dental Faculties, and the abandonment of the practice complained of. The question of honorary degrees never entered into the discussion. I contended that it was wrong to confer the regular degree upon one who had not gone through the curriculum of the schools. I am still of that opinion, and I am happy to say that there are very few who would now differ with me. The degrees conferred by the University of Buffalo were not of that character, for they did not pretend to be degrees in course, and were not conferred as such. This form of diploma has not, therefore, been "revived in a neighboring State," for there has been no pretence of conferring a degree in course.

There was no "embarrassing difficulty," because the men were already legally and professionally qualified for the positions which they afterwards assumed. It was simply an effort, in perfect good faith, to exhibit to dentistry a feeling of professional good will and fraternal fellowship, and as such should have been accepted unquestioned, as many such have been before on the part of other old universities and colleges.

I can assure you that it is only that there may be a proper comprehension of the truth in this case, and because the one side having been laid before your readers I deemed it but fair that the

other side should be heard also, that I have addressed to you this communication. The school is already established, and has placed its standard as high as that of the highest, and it proposes, so far as I know, to assist, according to its ability, in keeping the reputation of our profession unspotted.

I am very truly yours,

W. C. Barrett.

CHARLES MARCHAND ON PEROXIDE OF HYDROGEN.

To the Editor:

Dear Sir,—I notice in the March issue of your journal an article headed "Hydrogen Peroxide," and I take the opportunity to write to you about the erroneous information contained therein.

First, in his statement, Dr. S. says that H_2O_2 is made by the action of peroxide of barium upon hydrochloric acid. He might have reversed and said that it was made by the action of hydrochloric acid upon peroxide of barium, which would be more correct; but this is a small matter.

The main point is, that he is wrong in his assertion, because it is not always the process which is used by a number of chemists, particularly by myself.

He further says that he has obtained from New York, Brooklyn, and St. Louis some different samples of the best makes of peroxide of hydrogen, and that the said samples were submitted to a chemical analysis by Dr. Dudley, and that Dr. Dudley found a large percentage of muriatic acid and sulphuric acid.

Referring to the preparation manufactured by me, which is the result of a special process, absolutely unknown to Dr. Dudley, as well as to any one else, he says that, "*Even this preparation contains both muriatic and sulphuric acid;*" but he leaves out the percentage question.

Now, if you kindly refer to my pamphlet, page 5, at the paragraph headed, "Important Information on Peroxide of Hydrogen," you will see that I do not attempt at all to deceive the profession about the percentage of acid which is contained in my medicinal peroxide of hydrogen; and I explain on page 6 why it contains $\frac{1}{8000}$ of muriatic acid and $\frac{1}{10000}$ of phosphoric acid, the presence of which seems not to have been noticed by Dr. Dudley. Besides that, traces of sulphuric acid are present in my medicinal peroxide of hydrogen.

In his statement, Dr. S. claims that any one of the three brands of peroxide of hydrogen submitted to this analysis had a *sufficient* quantity of muriatic acid to dissolve a *tooth* after exposure to its action.

Now, just imagine the incorrectness of his statement by figuring as follows: One pound bottle of my medicinal peroxide of hydrogen is equivalent to four hundred and fifty grammes, and the total amount of acid which is contained in one pound is two-thirds of one milligramme of muriatic acid, half a milligramme of phosphoric acid, and traces of sulphuric acid which amount to about one-tenth of a milligramme.

Now, I shall leave to Dr. S. the care of making up the calculation in order to find out the number of pounds of peroxide of hydrogen which would be required to dissolve the *smallest* tooth of an adult; and, also, the time it would require to complete the dissolution of same.

Dr. S. seems to be under the impression that muriatic acid may dissolve phosphate of lime in any proportion; unfortunately, chemistry is an exact science, and a given quanity of muriatic acid will dissolve a corresponding quantity of phosphate of lime; but nothing more than that, whatever time may be allowed for the maceration.

I will be pleased, also, if he will kindly make a calculation in order to find out the number of pounds of my medicinal peroxide of hydrogen which will represent a *sufficient* amount of free sulphuric acid to dissolve the tooth or to transform it into a biphosphate of lime which is slightly soluble, and in sulphate of lime which is practically insoluble.

When he will have done this, if he imparts to me the results of his calculation, I will make it my duty to publish it in any medical paper of which you will be kind enough to let me have the name.

I agree with Dr. S. when he says that the experiments which he has conducted have not been as *thoroughly* and as *extensively* pursued as *desired*. I am glad of it, because from the start he has been on the wrong track.

On page 205 of your journal, Dr. S. stated the evolution of gas when peroxide of hydrogen is brought into contact with pus, and he says that the same evolution of gas takes place when the pus is not present in the mouth. I regret to say that in this assertion Dr. S. is not orthodox.

Every one knows that in the mouth of all human beings a certain amount of albuminoid substances are always present, and this mere fact, that peroxide of hydrogen is brought in contact

with those albuminoid substances, provokes its decomposition into water and nascent oxygen.

He says, also, that I claim that ozone is the active agent of my H_2O_2 medicinal. This assertion is untrue. By looking at page 3 of my pamphlet, at the article headed "Destructive Action of Ozone upon the Virus," I say that peroxide of hydrogen generates ozone, or, at least, the oxygen in a condition near to the state of ozone, as it is proven by a number of experiments of which you will find a synopsis on page 4.

Furthermore, when Dr. S. states that he has tried to obtain this evolution of gas when the H_2O_2 was placed in contact with pus removed from the abscess, his experiments do not show a marked success. It is possible he may have made a mistake and took some plain water, instead of peroxide of hydrogen. This is the only explanation I can give for the result reported by him.

When Dr. S. attributes the evolving of gas to the temperature of *ninety-nine degrees* which is present in the tooth, he is entirely mistaken, because when peroxide of hydrogen is heated at that temperature, the evolution of gas is hardly *perceptible.*

Following the experiment of Dr. S., when he has made an attempt to free the H_2O_2 from all acids, that is, muriatic and sulphuric, he evidently thought it was an easy matter to do this without decomposing the peroxide of hydrogen; but, having had some practice in the manufacture of peroxide of hydrogen, I would not undertake to perform this operation with any degree of certainty as to results.

In fact, my opinion is, that Dr. S. got rid of BOTH *acid* and *peroxide of hydrogen* which was contained in the acidulated solution. Then, of course, when he came to apply the liquid resulting from his above attempt, he could not see any evolution of gas in the canal or in the abscess. He might have repeated the same experiment a number of times, and he certainly would always meet with the same result.

Then he attributes to the muriatic acid the evolution of gas, and I wish to ask him *where the gas could originate*, since there is no gas to be generated when any acid is brought in contact with pus.

The statement presented by Professor Peirce is true. Peroxide of hydrogen acts in the way described by him. When Dr. Abbott says that he has been deluded into the idea that it was a test for the presence of pus, he seems to endorse the statement presented by Dr. S., and I am only sorry for him.

The statement of Dr. Volck, that by allowing a bottle of peroxide of hydrogen to stand open for a couple of hours, he did not find

anything in it but water, shows that he had at first water, and no peroxide of hydrogen.

If you think for an instant that I have kept my medicinal peroxide of hydrogen for thirteen months in my office uncorked without any appreciable change, you will agree with me when I say that the experiment of Dr. Volck is subject to doubt.

The statement of Dr. Fredericks is correct. That of Dr. Trumar is also correct; but the assertion that peroxide of hydrogen being placed in an atmosphere above sixty degrees is rapidly decomposed and becomes water is not absolutely true. I have had several samples of my medicinal peroxide of hydrogen exposed at a temperature which varied between seventy and seventy-eight degrees for eight months. At the moment the samples were put into experiment the test showed that the preparation was 15½ volumes capacity. At the expiration of eight months the test showed 15⅓ volumes.

He is positively right when he says he does not fear the agents that are mixed with H_2O_2, because they are all good in their place.

There is nothing easier than to reach the bottom of the pockets of pyorrhœa alveolaris by injecting the peroxide of hydrogen by means of a glass syringe into the cavity. Whenever peroxide of hydrogen is used on cotton the results will be unsatisfactory.

Dr. S., at the end of his report, says, "I have found that where there were pus-pockets, if I could get down with a little sharpened stick, carrying the acid (muriatic) far down, it will be followed by a healthy growth and resumption of an excellent condition."

Now, I will be pleased to witness the above operation, and to follow the results which would be obtained; and I will propose to Dr. S. to submit two patients affected with the same trouble, one to his treatment, and the other to the treatment with my peroxide of hydrogen (medicinal).

I am quite certain that the results which I will obtain will be of such a satisfactory nature that he will agree with me when I say that my medicinal peroxide of hydrogen is the most powerful and, at the same time, harmless destroyer of pus which is in existence.

I think that it is my duty, as well as it is the duty of people who know something about peroxide of hydrogen, to say so, and give their opinion. This is my excuse for having taken so much of your valuable space; but I hope that you will accept my apology.

Yours, very truly,

CHARLES MARCHAND.

Current News.

DENTAL LAW FOR THE DISTRICT OF COLUMBIA.

AN ACT FOR THE REGULATION OF THE PRACTICE OF DENTISTRY IN THE DISTRICT OF COLUMBIA, AND FOR THE PROTECTION OF THE PEOPLE FROM EMPIRICISM IN RELATION THERETO.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That it shall be unlawful for any person to practise dentistry in the District of Columbia unless such person shall register with the health officer in compliance with the requirements hereinafter provided.

SECTION 2. That a board to carry out the purposes of this act is hereby created, to be known as the Board of Dental Examiners, to consist of five reputable dentists resident of and for three years last before appointment actively engaged in the practice of dentistry in the District of Columbia, to be appointed by the Commissioners of said District for terms of five years and until their successors are appointed; *Provided*, That the first five appointments shall be made for terms of one, two, three, four, and five years, respectively. A majority of said board shall constitute a quorum. Vacancies occurring in said board shall be filled by appointment of eligible persons for unexpired terms.

SEC. 3. That it shall be the duty of the Board of Dental Examiners, first to organize by electing one of their number president and one secretary, to provide necessary books and blank forms, and publicly announce the requirements of this act, and the time, place, and means of complying with its provisions within thirty days from its passage; second, to promptly certify to the health officer for registration all who are engaged in the practice of dentistry in said District at the time of passage of this act who apply therefor; third, to test the fitness and pass upon the qualification of persons desiring to commence the practice of dentistry in said District after the passage of this act, and certify to the health officer for registration such as prove, under examination in theory

and practice of dentistry, qualified in the judgment of the board to practise dentistry in said District; fourth, to report immediately information of any violation of this act, and, annually, the transactions of the board to the Commissioners of the District of Columbia; *Provided*, That all graduates of dental colleges which require a three years' course of study shall be entitled to certificates upon payment of the certification fee, and without examination as to their qualifications.

SEC. 4. That it shall be the duty of every person practising dentistry in said District at the time of the passage of this act to make application to said board, in form prescribed by said board for certification, and present the certificates thus obtained for registration to the health officer within sixty days from the passage of this act. Every such person so registering may continue to practise without incurring the penalties of this act.

SEC. 5. That persons desiring to commence the practice of dentistry in said District after the passage of this act shall first obtain a certificate of qualification from the Board of Dental Examiners granted under authority conferred upon said board by Section 3 of this act, and present the same to the health officer for registration.

SEC. 6. That it shall be the duty of the health officer to register all persons presenting certificates from said board in a book kept for this purpose, and indorse upon each certificate the fact and date of such registration.

SEC. 7. That certificates issued and indorsed under the provisions of this act shall be evidence of the right of the person to whom granted to practise under this act.

SEC. 8. That any one who shall practise or attempt to practise dentistry in the said District without having complied with the provisions of this act shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be fined not less than fifty nor more than two hundred dollars, and in default of payment of such fine shall be imprisoned not less than thirty nor more than ninety days; said fines, when collected, to be paid into the Treasury of the United States, to the credit of the District of Columbia; *Provided*, That nothing in this act shall be construed to interfere with physicians in the discharge of their professional duties, nor with students pursuing a regular uninterrupted dental college course or in *bona fide* pupilage with a registered dentist.

SEC. 9. That to provide a fund to carry out and enforce the provisions of this act the Board of Dental Examiners may charge such fees, not exceeding one dollar for each certificate and ten dollars for

each examination, as will from time to time, in the opinion of said board, approved by said commissioners, be necessary. From such fund all expenses shall be paid by the board; *Provided*, That such expense shall in no case exceed the balance of receipts.

Approved, June 6, 1892.

ALUMNI ASSOCIATION, NEW YORK COLLEGE OF DENTISTRY.

THE following were elected officers for 1892: President, J. Howard Reed, D.D.S., M.D.S., 1881, 32 West Nineteenth St., City of New York; First Vice-President, M. Chas. Gottschaldt, M.D., D.D.S., 1882; Second Vice-President, Alfred R. Starr, M.D., D.D.S., 1880; Secretary, Vincent M. Munier, D.D.S., 1888, 102 West Ninety-fifth St., City of New York; Treasurer, Zachary T. Sailer, D.D.S., 1880, 40 West Thirty-third St., City of New York.

Executive Committee.—Sherman B. Price, D.D.S., *Chairman*, 1880, 13 West Thirty-second St., City of New York; H. J. Parker, D.D.S., 1883, and E. S. Robinson, D.D.S., 1889.

College Committee.—George A. Hull, D.D.S., *Chairman*, 1888; Arthur L. Swift, D.D.S., 1885; Wm. B. Davenport, D.D.S., 1888; S. E. Hamilton, D.D.S., 1887, and Louis C. LeRoy, D.D.S., 1887.

VINCENT M. MUNIER,
Secretary.

CONNECTICUT VALLEY DENTAL SOCIETY.

AT the annual meeting of the Connecticut Valley Dental Society, held at Greenfield, Mass., June 1, 2, and 3, 1892, the following preamble and resolutions were unanimously adopted:

WHEREAS, Advertisements, cards, and notices by dentists referring to "teeth without plates," crown- and bridge-work, etc., frequently appear in the public prints; and

WHEREAS, Such advertisements, cards, and notices are misleading to the public, in that they claim or imply that these devices are new, and that in constructing these appliances they possess a superior skill over other practitioners; and

WHEREAS, These devices are not new, but have been constructed and applied for many years past by various members of the dental profession; and

WHEREAS, The Code of Ethics governing Dental Societies says, "It is

unprofessional to resort to public advertisements, cards, hand-bills, posters, or signs, calling attention to peculiar styles of work, lowness of prices, special modes of operating; or to claim superiority over neighboring practitioners," and that "dentists are frequent witnesses, and, at the same time, the best judges of the impositions perpetrated by quacks; and it is their duty to enlighten and warn the public in regard to them;" and

WHEREAS, The objects of Dental Societies are to cultivate the science and art of dentistry and all its collateral branches, to elevate and sustain the professional character of dentistry, and to promote among them mutual improvement; therefore

Resolved, For the information and protection of the public, this Society condemn such advertisements, cards, and notices as not only unprofessional, but usually deceptive either by statement or implication.

GEO. A. MAXFIELD, D.D.S.,
Secretary.

THE MISSOURI DENTAL COLLEGE ALUMNI ASSOCIATION.

THE Missouri Dental College Alumni Association, Dental Department of the Washington University, St. Louis, Mo, gave their annual dinner, Wednesday evening, March 9, 1892, at eight o'clock, at Faust's. After partaking of the good things provided, President Walter M. Bartlett made the opening address. The following gentlemen responded to toasts:

Chancellor W. S. Chaplin; Dr. Henry H. Mudd, Dean; Dr. F. H. Achelpohl, Dr. DeCourcey Lindsley, Dr. J. C. Goodrich, and Dr. H. H. Reith. Remarks were also made by Drs. Conrad, Freidman, Prothero, Stevens, Fuller, and Harper.

The Association held its annual meeting at the College Building, commencement day, Thursday afternoon, March 10, at four o'clock, President Walter M. Bartlett in the chair. Eighteen names were proposed for membership and elected. The Association proceeded to elect officers for the ensuing year, which resulted as follows:

Dr. DeCourcey Lindsley, President; Dr. James B. Newby, Vice-President; Dr. G. W. Applegate, Secretary; Dr. Carl E. Schumacher, Treasurer.

Executive Committee.—Dr. W. M. Bartlett, Dr. J. B. Newby, Dr. P. F. Helmuth.

Meeting adjourned to meet next commencement-day.

DECOURCEY LINDSLEY,
President.

LAKE ERIE DENTAL ASSOCIATION.

At the Twenty-ninth Annual Meeting of the Lake Erie Dental ssociation the following resolution was unanimously adopted:

Resolved, That the manufacturers of porcelain teeth be requested to re- ıce the price in the same ratio to the decline in that of platinum. The ad- ıance in the price of this metal having been the alleged reason for the increase the price of teeth.

C. D. Elliott,
Secretary.

DENTAL SOCIETY OF THE STATE OF NEW YORK.

At the Twenty-fourth Annual Meeting of the Dental Society the State of New York, held at Albany on the 11th and 12th st., the following officers were elected for the ensuing year: President, W. W. Walker, New York; Vice-President, F. T. Van oert, Brooklyn; Secretary, C. S. Butler, Buffalo; Treasurer, H. Mirick, Brooklyn; Correspondent, R. Ottolengui, New York.

Chas. S. Butler,
Secretary.

May 18, 1892.

NORTHERN OHIO DENTAL ASSOCIATION.

The next meeting of the Northern Ohio Dental Association will held in Akron, Ohio, the first Tuesday in May 1893.

The newly-elected officers are, President, W. H. Whitslar, eveland; Vice-President, S. B. Dewey, Cleveland; Correspond- g Secretary, H. Barnes, Cleveland; Recording Secretary, L. Bethel, Kent; Treasurer, Chas. Buffett, Cleveland.

H. Barnes,
Corresponding Secretary.

RECENT PATENTS.

A list of recent patents, reported specially for the International Dental Journal.

476,088.—Dental Flask. William E. Stiles, Philadelphia Pa., signor of one-half to Mahlon Moyer, same place. Filed No- mber 18, 1891.

476,125.—Dental Flask-Holder. Emory A. Bryant, Asper Col. Filed January 10, 1891. Renewed April 14, 1892.

476,496.—Hand-Piece for Dental Engines. Wm. M. Speakmar Philadelphia, Pa. Filed February 23, 1892.

476,605.—Artificial Tooth. Robert Brewster, New Barnet England. Filed September 23, 1891. Patented in England Ma 1, 1890.

476,944.—Dental Engine. Rudolph M. Hunter, Philadelphia Pa. Filed February 12, 1892.

477,076.—Dental-Engine Attachment. Henry E. Spencer Spencer, Miss. Filed October 10, 1891.

477,225—Dental Drill. Carl Rauhe, Dusseldorf, Germany Filed March 24, 1892.

477,411.—Dental Plugger. Andrew J. Harris, Chicago, Ill Original application filed May 5, 1891. Divided and this appli cation filed July 16, 1891.

477,619—Dental Plugger. Martin L. Bosworth, Warren, R. I Filed February 11, 1890.

Trade-Mark. 21,230. Local Anæsthetic for Painless Extractio of Teeth. Howe & Dills, Carlisle, Ky. Filed May 4, 1892. Es sential feature, the words "Surmodont Analgia."

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

The annual meeting of the National Association of Dental Ex aminers will be held at Niagara Falls, Monday, August 1, 1892, a ten (10) A. M. All State Boards are invited.

FRED. A. LEVY,
Secretary.

Selections.

PHILADELPHIA COUNTY MEDICAL SOCIETY.

The following abstract is given from Dr. S. Solis-Cohen's paper "Shall Physicians become Sales-Agents for Patent Medicines?"

"In an address to the Medical Society of the State of Pennsyl vania at its last meeting, in calling attention to the allianc between the secular press and the empirics and nostrum-venders,

felt justified in saying that the publishers of magazines and newspapers that allowed themselves to advertise the curative virtues of this or that ready-made preparation or alleged remedial measure, to be applied indiscriminately to all cases,—whether of one disease or of many diseases,—were accessories to a crime against the unfortunate and the helpless; not alone because of the money filched from the pockets of those deluded by the false promises held out to them; not alone because of suffering unrelieved and lives deprived of their chance for prolongation; but in many instances because of the disease and suffering and death directly produced by the poisonous compounds and noxious gases administered to any that chose to purchase. If such criticism were justified—and who is here that will deny its truth?—if such criticism were justified when applied to those who make no pretence of special knowledge or of devotion to a noble art,—to those whose object is solely and avowedly commercial,—what language remains to characterize the action of medical journals that permit the insertion in their columns of advertisements such as these that I pass around? What severity of reprobation is adequate for the conduct of the *Journal of the American Medical Association*? What words of condemnation are strong enough for the physician that permits his name to be associated with these devices of the devil?

"The frankly unscrupulous patent-medicine vender, the maker of 'Safe-cures,' or 'Temperance Bitters,' or 'Sure Specifics,' is at least to be commended for what, to paraphrase a remark of Senator Benjamin Harrison's, may be termed his 'bold brutality.' His allegations of philanthropic motives are not intended to be believed; they deceive no one—they are the recognized *ad captandum* devices of the cleverer advertiser—and, in the sale of his wares, there is no pretence of examination, or of diagnosis, or of prescription based on diagnosis.

"Far more iniquitous and far more dangerous to society is the wily manufacturer that advertises 'to the profession only.' Whether he ostentatiously holds secret the composition of his nostrum, or whether with pretended frankness he describes it with an appellative that means nothing, or publishes a formula that cannot be carried out, his object is the same; he seeks to make the physician's the hand whereby he may reach pockets shut from the coarser methods of the Warners, the Pinkhams, and the Jaynes; or, after all, it is the minority that can be deluded by the flaring posters of 'Wizard Oil,' or the lying testimonials of 'Tonic Vermifuge.' When a sick man applies to a physician, thinking that

thereby he will secure the benefit of special knowledge brought to bear upon the conditions of the individual case, intrusting to the conscience of his medical adviser his health and his life, he is entitled to the skill and the thought for which he pays, and that he deems himself to be receiving. He certainly deserves better treatment than to be handed over to the mercies of 'antikamnia,' or 'febricide,' or 'quickine,' or 'gleditschine,' or 'Freligh's tablets,' or 'Listerine,' or any other of the unholy crew. If such is to be his fate, let him have the satisfaction of buying the worthless or poisonous stuff direct, without the sham of a professional consultation, and without paying purchaser's commission to the medical sales-agent.

"At the coming meeting of the State Society I propose offering the following resolutions, for which I ask the support of this Society:

"*Resolved*, That the Medical Society of the State of Pennsylvania hereby expresses its highest disapprobation of the practice of giving certificates or testimonials to secret preparations alleged to be of medicinal virtue, and calls the attention of the affiliated county societies to the fact that such action on the part of members of the said societies is in derogation of the dignity of the profession, and in violation of the letter and the spirit of the Code of Ethics of the American Medical Association and of this Society.

"*Resolved*, That this Society likewise expresses its disapprobation of the practice of inserting advertisements of secret preparations in the columns of medical journals, such action being an insult to the intelligence of the profession, and a degradation of journals indulging therein to the level of the patent-medicine almanac. Especially to be condemned is the action of the *Journal of the American Medical Association* in admitting such advertisements.

"*Resolved*, That copies of these resolutions, duly attested by the permanent secretary, be sent to all county societies in affiliation with this Society, to the American Medical Association, to State medical societies in affiliation therewith, and to the publishers and editors of American medical journals."

On motion of Dr. J. Madison Taylor, the resolutions were adopted as the sense of the Philadelphia County Medical Society, and the delegates to the Medical Society of Pennsylvania were instructed to officially present and support them.—*Journal of the American Medical Association.*

ABSTRACTS FROM THE RESPONSE OF THE EDITOR OF THE "JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION."

"To all questions there are two sides, and it seems that the reasons for the course which the *Journal* has pursued in this matter should be set before the members of the Association.

"The ideal in medical journalism has not, and never will be, attained, and it is well that this is so, for then the ambitious journalist would in a great measure cease his labors.

"Not infrequently a physician is seized with an ambition to show his fellows just what a medical journal should be and what it should do, and one of the first propositions in his mind is a publication that will be absolutely clean and free from all repugnant advertisements, and, in his estimation, all advertisements are repugnant.

"A theory is adopted that an announcement to the medical profession of a medical journal without advertisements will cause hundreds and thousands of names to be sent in as subscribers. The theory is excellent, the ideal is on a high plane; but, unfortunately, the hundreds of expected names do not come in, but, instead, the printer's monthly statement is singularly prompt, and, if not at once paid, a dun quickly follows, saying paper bill is due, and printers must have their wages every week, to say nothing of rent, taxes, etc.

"The luxury of furnishing copy and seeing a clean publication is highly enjoyed. English adjectives are not sufficiently strong to do justice to the publication; but the vexatious counter-irritation produced by the aforesaid bills fairly blisters the ideal journal, the monthly application soon becomes monotonous, and a running sore is established. The ambitious editor loses patience with all other members of his profession for not flocking to his relief, and as they don't flock, he is apt to indulge in adjectives and resolutions of condemnation. There is no hazard in saying there is not an editor in this country who would not greatly prefer the management of a journal without advertisements than one with them. In the founding of the *Journal of the American Medical Association*, the trustees appointed by that body would have much preferred to start the *Journal* without advertisements than with them; but the means at their disposal were not only small, but very limited, so that the question presented to them was not of an exclusion of

advertisements, but one of founding a journal that would have sufficient life-giving properties to exist after its establishment.

"The line to be drawn by the publisher must always be guided by his own judgment, and a maturity of knowledge in this direction comes only with an experience of years, and may justly be classed with the skill of an expert in a professional specialty.

"For the growing use of such preparations several reasons may be assigned. Practitioners in the country and smaller communities do not have at their disposal the extensive pharmaceutical resources of their brethren in the larger cities, and to men so situated compressed tablets, and articles of like description, have proven a great boon. The convenience of ready-made preparations once appreciated, the tendency of these gentlemen to lessen their already arduous labors by the further use of such preparations can be readily appreciated. They can, by their use, present their patrons with much more elegant specimens of pharmaceutical work than they can possibly produce from the crude and limited materials to be found in their saddle-bags. Probably these factors of convenience in dispensing and elegance in preparation have contributed more than all else to the use of these much-condemned proprietary preparations. Be that as it may, there certainly does exist on the part of the profession at large a wide-spread demand for just these things.

"That it is not scientific to use as remedies preparations whose composition is known but in part is certainly true, and that it is absolutely unjustifiable for any physician to use a preparation whose composition is entirely unknown is likewise true. Just what advertisements should be excluded from appearing in this particular publication is, of course, a matter of individual judgment, in which probably no two men would agree exactly.

"Exclude all advertisements of proprietary medicines, says the Philadelphia County Medical Society.

"To this we will not object if—the Philadelphia County Medical Society will donate to the *Journal* an equivalent sum of money and furnish a guarantee that this will be continued for a long term of years; but even that could not well be afforded by the *Journal* for the advertisements continuously furnish the members of the American Medical Association with information which many want and which they could not otherwise obtain unless by taking some other journal.

"Furthermore, the art of pharmacy has kept fully abreast of the advances made in other departments of medicine. To such a

dable extent has the work of the pharmacists progressed, that e American Medical Association, two years ago, incorporated armacy with materia medica, and made of it a Section of the sociation.

"The manufacturers of proprietary preparations should be re-ired to make public the ingredients of such preparations. The thod of manufacture and the skill used in preparation is their n property, and physicians need not have a practical knowledge these methods in order to make an intelligent use of such nedies. A knowledge of the methods used for extracting quinine m cinchona bark is not needed by physicians any more than a owledge of the method used in the manufacture of champagne ore drinking, or of the baking a pudding before eating.

"Suppose the Philadelphia medical journals would all unite and ow out their advertising patronage, and at the same time double ir subscription rate; how long would it take for the physicians Philadelphia to say to their home journals, Erase our names; can get an equally good, but no better journal, plus the adver-ing pages, published in New York for one-half the price you and. We like to patronize home talent, but don't like to be bed to pay for it. In that spirit and expression the Philadel-a physician would be but the counterpart of nine out of every the country over, and it is the subscriptions of the nine that ain the journals.

"As rapidly as contracts expired during the past year, undesira-patrons of the advertising pages have been eliminated, and rs of orders during that time amounting to more than eighteen dred dollars have been rejected because of their character. s work of elimination might, perhaps, have been carried further, we can say without hesitation that the pages of the *Journal* reasonably free from objectionable advertising matter, and that ch is published represents to the Association for the current a sum exceeding twelve thousand dollars.

'This amount is named, and easily verified, so that the Phila-hia County Medical Society may know approximately the sum ually needed to make good the losses from this source, and the of the luxury they have resolved upon.

'One other point. The advertising pages of this journal are pletely divorced from the reading matter. No 'reading ces' appear in its pages. All matter which has any appearance n advertising character about it is carefully excluded from its ing matter. The advertisements are understood to be paid

material, *ex parte* statements, and to be taken for what they ar worth, just exactly as advertisements are everywhere.

"In this connection, it is instructive to look at the advertisin pages of the *British Medical Journal*, truly our sister, as it is pul lished, like this journal, under the auspices of a great nationa medical association. Among the advertisements which appear i the last number which has reached us, we notice 'Bynin,' 'Br midia,' 'Bovinine,' 'Cocatina,' 'Pepsalia,' 'Flitwick,' etc."

THE

International Dental Journal.

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Original Communications.[1]

DEMONSTRATION OF THE RETICULUM IN DENTINE WITH LOW POWERS OF THE MICROSCOPE.[1]

BY C. HEITZMANN, M.D.

THE first who maintained that the dentine has a reticular structure was C. F. W. Bödecker. In his paper, "The Distribution of Living Matter in Human Dentine, Cement, and Enamel" (*Dental Cosmos*, 1878–79), this writer says, "The basis-substance of the dentine shows a distinct, net-like structure. The light spaces surrounding the dentinal fibres send delicate elongations into the basis-substance, in which, through repeated branching, a light net-work is established, the meshes of which contain the decalcified (after treatment with solution of chromic acid), glue-yielding basis-substance. The finest offshoots of the dentinal fibres can be traced only into the mouths of the elongations of the canaliculi; on the periphery of the latter, owing to their great delicacy, the offshoots are lost to sight. Coarser offshoots of the dentinal fibres . . . traverse the basis-substance within its light net-work, at the same time uniting dentinal fibres directly, and sending slender conical offshoots into the light net-work of the basis-substance."

[1] The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

[1] Read at a meeting of the New York Odontological Society, May 17, 1892.

At the conclusion of his paper this author says, "The dentinal canaliculi are excavations in the basis-substance of the dentine, each containing in its centre a fibre of living matter. Besides the dentinal canaliculi, there exists an extremely delicate net-work within the basis-substance of the dentine, into which innumerable offshoots of the dentinal fibres pass. Although we cannot trace the living matter throughout the whole net-work in the basis-substance, we are justified in assuming that not only the dentinal canaliculi, but the whole basis-substance of the dentine, is also pierced by a delicate net-work of living matter."

From these quotations it is evident that Bödecker, with the method employed at that time,—*i.e.*, softening the dentine with solutions of chromic acid and slicing it with the razor,—saw a light reticulum, of which he assumed that it contained the living matter, judging from analogies in other varieties of tissue. The positive proof that Bödecker's assumption was correct was furnished much later, in 1887, by William Carr. He ground fresh dentine, kept moist with a weak solution of table-salt, to an extremely thin slab, which was left exposed to the influence of a half of one per cent. solution of chloride of gold for a number of hours, and was afterwards decalcified with a six-per-cent. solution of glacial acetic acid. The chloride of gold has been known for twenty-five years to stain a dark-violet color the living matter proper, having been first introduced into histology by Cohnheim for the purpose of staining the nerves of the cornea. Specimens obtained by William Carr beautifully demonstrated a dark-violet reticulum throughout the basis-substance of the dentine, being in direct union with the dentinal fibres as well as the coarser offshoots emanating therefrom. Some of these specimens were so convincing that I have demonstrated them with high powers of the microscope (one thousand to twelve hundred diameters, immersion) to a number of gentlemen of the medical and dental profession, in order to prove to them that all tissues, including the hardest of the teeth, were pervaded by living matter, the whole body thus being made a continuity, not only of protoplasm, but of its most essential constituent part, the contractile or living matter. Among those who publicly announced their conviction of this novel fact of such a great biological importance were Frank Abbott and W. H. Atkinson. Abbott speaks of this topic in the following words (Annual Address of the President of the American Dental Association, August 28, 1888): "The certainty of Bödecker's conclusions that the whole basis-substance of the dentine is pervaded by living matter has finally been reached

by new methods adopted by William Carr, of New York, who, at his convenience, proposes to lay the results of his studies before the profession." William H. Atkinson, in his last paper, "The Origin of Pus" (*Journal of the American Medical Association*, 1889), expresses his conviction in the following way: "The presence of this reticulum was first established by C. F. W. Bödecker in 1878, who saw light rents in the basis-substance, and assumed them to hold living matter without being able to directly prove its presence. This proof has been recently furnished by William Carr, who, after decalcification of the dentine, rendered the reticulum visible by staining with a chloride of gold solution and osmic acid. These last results have not as yet been published by their observer."

Dr. William Carr, however, delayed finishing his work, and after waiting for years, I asked his permission to shift over the topic to another worker, John I. Hart, of New York. Dr. Carr kindly consented, and gave permission to Dr. Hart to use his specimens as best he could. Dr. Hart made a large number of new specimens, treated with chloride of gold, and published the results of his observations in a paper,—"Minute Structure of Dentine" (*Dental Cosmos*, September, 1891). So perfect were his specimens that he was enabled, by the configuration of the dentinal fibres and the reticulum, to tell at once whether the dentine examined came from a living or from a devitalized tooth. Besides, a large number of facts were obtained by him of the utmost interest and importance to the dental practitioner.

Still, the reticulum was demonstrable only with high powers of the microscope to eyes well trained for such observations, and thus it is explicable that some persons not in possession of trained eyes expressed their doubts as to the presence of such a reticulum.

Dr. Bödecker resumed work in my laboratory towards the end of 1891, with the purpose of studying the reaction in the dentine upon fillings of a widely different nature. He had collected a large number of teeth that were filled for months and years. The first tooth he ground thin was a bicuspid with two cavities in its crown; one filled with cement, the other with silver-amalgam,—both plugs having been in the cavities for years. How great was his surprise when, examining the border of the cavity previously filled with amalgam, he saw a dark-brown discoloration of the dentine, not directly along the border of the cavity, but some distance away from it, and in this brown zone the dentinal canaliculi, respectively their tenants, the dentinal fibres, crowded with black dots, and their offshoots rendered wonderfully plain by

a black deposit. In the darkest portion the reticulum was easily seen with comparatively low powers of the microscope,—viz., five hundred diameters.

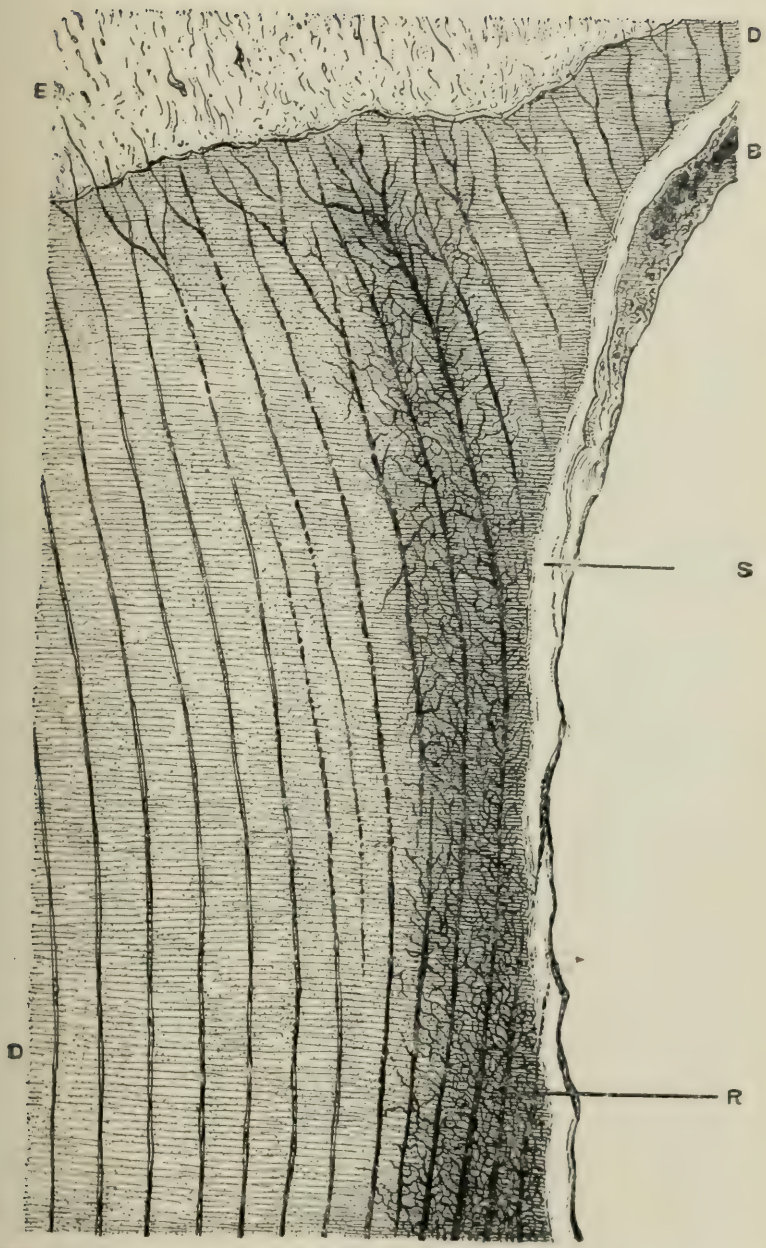
With the kind permission of Dr. Bödecker I lay before you this specimen (see Fig. 1) with a few brief remarks.

The border of the cavity is, in the upper portion, seen in the breadth of the specimen, and here it holds a number of black metallic particles, evidently not of the amalgam itself, but of a sulphur-combination of the silver or quicksilver. The zone of the dentine directly bordering the cavity is, apparently, destitute of structure, showing but faint traces of canaliculi, of a high refraction, obviously in a state of consolidation, a reactive process subsequent to the filling. Close beneath this consolidated layer follows a dark-brown zone, diffusively pigmented, and here we see the dentinal canaliculi crowded with black metallic particles, considerably widened and sending black offshoots into the basis-substance between the canaliculi. The offshoots are comparatively scarce and large towards the enamel, where the unstained canaliculi show only the usual bifurcation. The offshoots are more numerous upon entering the dark-brown region of the dentine, and in the darkest portion are so numerous and so delicate that the power of five hundred diameters is insufficient to dissolve the minutest branches, all of which inosculate into an extremely delicate black reticulum. All the features, the coarse and fine offshoots and their union into a reticulum, are identical with the image obtained by John I. Hart in living dentine, treated with chloride of gold.

How did the metallic particles reach the dentinal canaliculi, and produce such an image at a certain distance away from the border of the cavity? There is but one answer possible to this query. The metallic particles were taken into the living matter, probably before the consolidation was accomplished at the border of the cavity, and carried farther, at the same time rendering visible the reticulum, interconnecting the dentinal fibres. It would be impossible to understand the loading of the dentinal fibres, which run a parallel course and are separated from one another by the intervening basis-substance, unless by the presence of transverse connections of the fibres, as actually shown by the reticulum. This reticulum is, in fact, so plain that any tyro must see it, and the specimen alone is sufficient to remove the doubts of even the most sceptical minds.

A second specimen is placed under another microscope, likewise with a power of five hundred diameters. (See Fig. 2.)

FIG. 1.



GROUND BICUSPID. CAVITY OF THE CROWN PREVIOUSLY FILLED WITH AMALGAM. MAG-
ED 500.—E, enamel; DD, dentine; B, border of cavity; S, solidified dentine along the
er of the cavity; R, reticulum, brought forth by the amalgam.

FIG. 2.



GROUND MOLAR. THE PULP PREVIOUSLY TREATED BY THE HERBST METHOD. THE CA ITY FILLED WITH AMALGAM. MAGNIFIED 500.—C, pericementum; O, osteoid layer of ceme tum; P, protoplasmic bodies at the interzonal layer between cementum and dentine; granular layer of dentine of the neck; D, dentine of neck. A few club-shaped enlarg ments of dentinal canaliculi. The reticulum brought forth by the amalgam.

The field exhibited is the neck of a molar whose pulp years ago was treated by Wilh. Herbst, of Bremen, Germany, with his method, recently made known in this country by Dr. Bödecker, at the meeting in Albany. Dr. Herbst applies cobalt upon the exposed or inflamed pulp of the crown; a few days afterwards he excises the pulp down to the root-canals; introduces tin-foil, which he grinds down at the bottom of the cavity, thus shutting off the pulp of the root-canals from contact with air, or other filling materials placed into the cavity of the crown. Two such molars were sent by Dr. Herbst to Dr. Bödecker, and the latter kindly consented to have these specimens exhibited at this meeting. The remarkable outcome of Bödecker's examination of the teeth sent by Herbst is that the pulp remains alive in the root-canal, and is sufficient to endow with life the whole tooth, though its crown is entirely deprived of its pulp. This fact becomes intelligible only upon the presence of interconnections between the parallel dentinal fibrillæ; for the dentinal fibres could not possibly be kept alive in the crown, unless by unions with the fibrillæ of the roots, the only ones kept directly alive by the pulp-tissue of the roots. This is an indirect, though stringent proof of the presence of the reticulum. The direct proof is furnished by the visible interconnections of the fibrillæ along the neck of the tooth, of a brownish color, in a slightly-brownish basis-substance. After having examined many hundreds of teeth under the microscope in all sorts of pathological changes, I have never met with such a discoloration in the dentine so frequently observed in the enamel. It is quite possible and reasonable to assume that the metallic salt, originated at the border of the cavity, was transferred into the dentinal fibres and their offshoots, and was, at last, deposited in the fibrillæ and their offshoots in the region of the neck, which, as John I. Hart's researches prove, abounds in living matter far in excess of any other portion of the dentine. This, I admit, is an hypothesis, to which I resort for lack of a better explanation; it is nearest to my mind, after thirty-two years of study of the teeth, having become so thoroughly convinced of the life of all constituent tissues of the teeth. The specimen under consideration exhibits an ill-calcified dentine, for it shows numerous protoplasmic bodies at the border of the dentine towards the osteoid layer of the cementum, and club-shaped enlargements of some dentinal fibrillæ. The granular layer of Tomes in the dentine of the neck destitute of dentinal canaliculi is narrower than in thoroughly calcified teeth; but present, nevertheless.

My intention in exhibiting these two specimens is to stop short

all further doubts as to the reticular structure of the basis-substance of the dentine. In the face of the facts demonstrated I am entitled to expect such a result.

CROWN- AND BRIDGE-WORK.[1]

BY DR. C. M. RICHMOND, NEW YORK.

(Continued from page 578.)

In my August article I have shown a crown (detachable). I did not give the full details of its construction, as that will come in the papers on crowns.

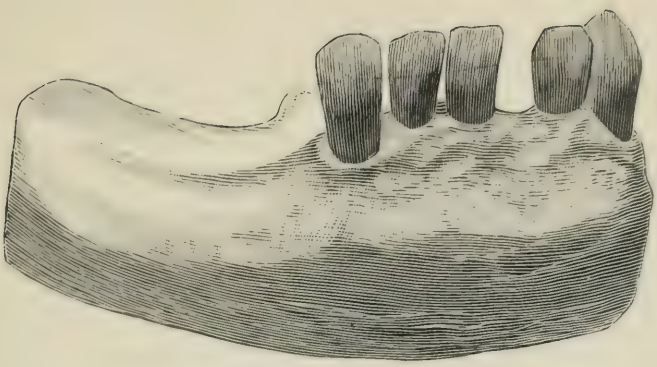
I have taken for my third article two cases of plate and bridge combination, both of which are nearly alike in appearance, although the methods of construction are different. As I have both cuts, I illustrate them.

The first case is a lower piece with five teeth in front, one incisor being lost. It will be seen by reference to Fig. 1 that the gold attachments are made to fit the teeth perfectly, without in the least impinging upon the gum tissues. The first step in the construction of this case is to take an impression of the cuspid teeth with plaster, and by placing a thin piece of steel or other thin metal between the tooth to be taken and the adjoining tooth, I can get a perfect impression with the two teeth apart, so that a fusible metal die can be cast into the impression of the cuspid alone, and thus secure the means of fitting a perfect clasp to the two eye-teeth, as shown in Fig. 2.

After having perfect models of these teeth, they are fitted with a band of twenty-two-carat gold, thirty in thickness (United States standard guage), entirely to the gum line, letting the bands meet, and soldering them together at the side where the opening is shown in Fig. 1. I then fit around this band a band of clasp metal. The first band is now invested inside only, and I leave enough of the investment to serve as a base for it to rest on and remain upright while soldering. After the two bands are invested in this way, a clasp-band is slipped over them, and, after heating to the proper degree, small pieces of solder are dropped onto the edges of these bands and the two gradually soldered together, and by lowering the,

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[1] Copyrighted, 1892, by Dr. C. M. Richmond.



Model of plaster.

FIG. 1.

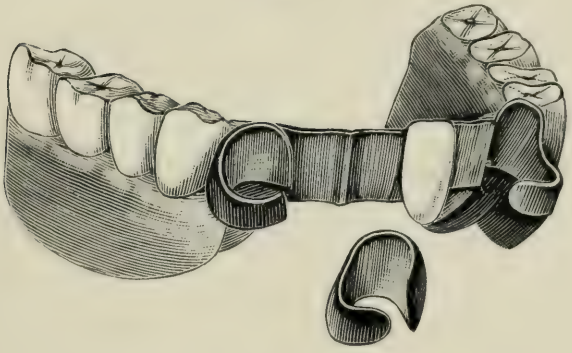
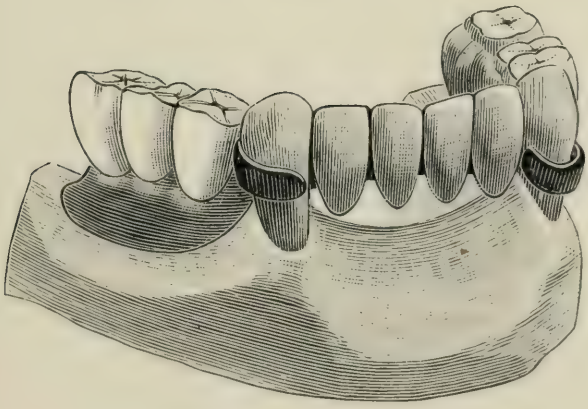
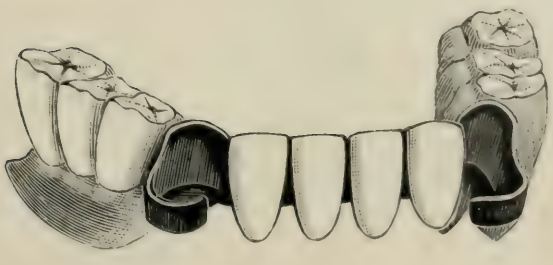


FIG. 2.



Teeth on model.

FIG. 3.



clasp-band a little lower than the gold one room is secured to begin to solder. A solid clasp is very easily made with a soft and perfectly-fitting gold surface next to the teeth. I cut them apart at the sides next to the adjoining teeth, as shown in Fig. 2. After the clasps are finished and fitted to the two canines, a tooth is waxed (to fill in the space where the one is lost) into position by drying the surfaces of the natural teeth, and also covering the facial surface of the porcelain with hard wax, and thus a tooth is firmly held long enough to take an impression of the lingual surfaces for the purpose of casting a fusible metal die.

When this is done a perfect surface is secured over which to burnish pure gold between the clasps, which I now have in a model in fac-simile. After this piece of pure gold has been perfectly fitted by burnishing, it is invested, leaving the surface I wish to solder exposed. This must now be covered with clasp-metal and solder. I make with my clasp-benders pieces of clasp-metal to fit each tooth-surface which has been brought out in the pure gold burnishing, and by laying these into position on the gold the solder is applied, and gradually the pure gold and clasps are all soldered together in one piece, and I have here also a plate with a soft piece of gold to fit the tooth-surface, while the strength is accomplished with the clasp-gold soldered on to the surfaces, as in the bands I have already described.

Having the clasp and the plate finished, they must now be fitted together in the mouth and soldered in one piece, and therefore the bands are placed onto the canine teeth, and while in position the plate is fitted between these bands, so that it can be tied into proper position on the teeth with a piece of silk.

After all are in position, a plaster impression is taken of the case, and upon removal thereof I take off my bands and plate and fit them into position in the impression, and into this I pour investment. After this is hard the plaster is cut away and the case is put into the fire, and the plate and the two clasps are soldered together in one piece; this is now put onto the teeth in the mouth, and, if all is correct, a perfect-fitting piece of work is produced that will go down to its place on the teeth and no farther, and it is immovable except when taken off by the hand of the patient. This part of the work, being well done, is the groundwork for the whole case. To attach the bicuspids and molars is an easy operation, and is done by placing the part finished in position and taking a plaster impression of the mouth back of the plate; then, by placing the plate into the impression, a plaster model is prepared and a

plaster fac-simile of the case is produced, with the parts that are finished in position.

A pattern of tin is now made the size I wish to make my plate, and I then cut the plate (which is pure gold, thirty in thickness). This can be put onto the plaster model and carefully worked down to its place, and it can be made to fit perfectly in this way. This is then waxed to the clasps and the gold, and it can be carefully removed from the model and the two gold plates soldered to the clasp, after having been invested. It is now replaced on the model, and if the plates fit the model perfectly when the front piece is in position it is ready for the articulation, which is done in the ordinary way, and the teeth are ground into position. Gum teeth were used in this case and banded to finish the outside, while solder made the inside finish, as the front tooth is placed in position by drilling two holes through the gold which crosses the space where the front tooth is gone and is waxed with hard wax, and being a tooth with long pins it is easily held where it belongs until the last investment, where all the teeth are soldered to the work.

In the case (Fig. 3) here presented is a bridge between the canines, and it was worn for weeks before the molars and bicuspids were put on the construction, and this is accomplished by making the two canine bands like the previous ones, and then having the incisor teeth backed up in the usual way. They are waxed into position and tried in the mouth, two teeth being waxed to each band, and when in proper position a plaster impression is taken, and, after placing the two bands and the four teeth into the impression, investment is poured over it. After having cut away the plaster impression, the teeth are soldered together and attached to the bands. The bridge part is now finished. This case can now be taken off and replaced as many times as one may require to adjust the back teeth, which are backed up in the usual way and waxed onto the case, one at a time, until they are perfectly articulated with the upper set of teeth, and then they are all soldered to the bands, and are at the same time made fast together, one with the other, so that there is now a set of teeth held in position by two bands on the cuspidati, no part of the work touching the gums.

I wish to put a small saddle of pink rubber under the molars and bicuspids, so that there will be no motion to the structure while in use. This is accomplished by making a small base of wax on the lower ends of these teeth, to serve as an impression-cup. Plaster is now mixed, and the wax is filled with enough to take an impression of the gums directly under the molars and bicuspids.

After the case is removed a model is poured into the impression, and the teeth are now in position on a plaster cast, showing the space where pink rubber is to be placed as a base to support the work from the canines back. The cast is waxed up and put into the vulcanizer, leaving the teeth and gold part exposed, so that when the flask is separated the gold and teeth will come out in the upper half of the flask, and leave only the model of the lower gum in the lower half. Pink rubber is now packed and the flask put together in the usual way, and the case is vulcanized, as is shown in Fig. 3. I take a disk and groove the lower end of these teeth so that the pink rubber will have a perfect surface to fasten to. This case, like the first one, does not impinge on the gum tissues in the least degree at the canines or between them, and is what I choose to term plate and bridge combinations.

The first case is worn by Dr. A. L. Northrop, and the latter one by Dr. W. H. Dwinelle.

I am giving only practical cases, and shall confine my articles to such as have been in successful use for a period of time to prove them practicable. I refer to this subject because, while Dr. Farrar was publishing his articles on regulating, I frequently heard men high in our profession say, "That looks well on paper; I wonder if it will prove successful." "It is all theory," etc., while the fact is, every case published by Dr. Farrar was a practical one, and the models are at this writing in his office, where they can be seen and admired by all who will take the trouble to look at them.

(To be continued.)

PRIMARY AND STORAGE BATTERIES FOR DENTAL PURPOSES.[1]

BY JERE. E. STANTON, M.D., D.M.D., BOSTON, MASS.

In presenting this subject to you, and to the readers of the International Dental Journal, I am aware that it will provoke censure on account of the many failures that have been met with in the use of primary batteries. It is not my desire to induce any one to purchase an apparatus that will prove a source of annoyance to him.

[1] Read at a meeting of the Harvard Odontological Society, held at Boston, Mass., April 28, 1892.

Our Society has not had a paper on electrical apparatus, and, although I cannot treat the subject exhaustively, I feel sure my experience will prove of interest.

Electrical science has made such immense and rapid strides in the past few years that it is impossible for one not making it a business or profession to become anything like an expert, so I trust you will bear in mind that I am here to tell my experience with primary and storage batteries.

The first time I tried a battery for power was three years ago. For two years I tried various forms of bichromate of potash batteries, and all the motors that I could find that were made to run by a battery. A little more than a year ago I read an article on storage batteries that led me to think they might be used for dental purposes. After some investigation I learned that the capacity of a storage cell was limited, and many users said they were unreliable after a few months' active service, while others reported perfect satisfaction.

Having become interested in the subject of electrical storage, I continued to make inquiry whenever opportunity presented a chance of learning something about it, and finally concluded to go to Lowell, where a factory is in operation for the manufacture of storage batteries. There I learned the principle of their construction, why some failed, and others were successful.

It is well known that Planté devoted many years to the investigation of the storage capacity of different metals; that he finally decided that lead would deliver the greatest amount of electricity. So far as I know, no one has found a metal that will do as well.

Planté used plain lead-plates, but in a short time after he had published his researches, Faure produced a battery, more quickly made, and having a much larger storage capacity.

The sheet-lead of commerce has a slight coating of oxide on its surface; this oxide on the anode, or positive pole of the battery, is made a peroxide by the addition of oxygen; and the oxide coating on the cathode, or negative pole, is reduced to fine metallic lead, granular in form, by the action of hydrogen. By charging this battery, first in one direction, and then (after discharging it) charging it again in the opposite direction, and repeating this operation a number of times, it is found that the coatings grow thicker and thicker, till a point is reached beyond which no additional storage strength can be gained.

Faure conceived the idea of coating the plates with the red oxide of lead, made into a paste, holding it in place with felt placed

between the plates, and placing them in acidulated water, as Planté did; by this means a much thicker coating could be placed upon the plates than could be done in a lifetime of charging and recharging. It is easy to see how by this means the capacity of the battery can be increased. The placing of felt, or any other material except vulcanite strips, or wood boiled in paraffine (for the purpose of keeping them in place, and to prevent them from touching), has been abandoned, and the paste of lead oxide is held in place by having the plates perforated or built up of lead-tape formed into small convolutions.

If a paste is used it is made by mixing one part of commercial sulphuric acid with two parts of water, letting the mixture stand till cold, then adding enough of the red oxide of lead to make a stiff paste; then, by means of a spatula, working it into the holes in the plates for the positive element of the battery. The same thing is done for the negative element, using litharge in the place of red lead, or there may be a combination of the litharge and red lead for both plates. After the paste has dried they are arranged alternately, with strips of some non-conductor not affected by acid between them and bolted firmly together; all of the positive plates are connected, making the positive pole, and the negative plates treated in the same way, making the negative pole. In very small batteries there are two positive and three negative plates; in the larger the plates are equal in number. The positive pole of the dynamo is now connected with the positive plates and the negative with the negative plates, and the plates are formed. This process takes in all about one hundred hours, and results in changing the red lead to peroxide, and the litharge to nearly metallic lead. The positive plates turn a very dark-brown or chocolate color, the negative a light-slate. The pasted plates are not reversed, but always charged in the same direction during the process of forming. After once being formed, both the pasted and the unpasted plates are charged and discharged in the same direction. It is not very difficult to make a battery of the unpasted type if one is so disposed, and such a battery will give good service in dental work for some time.

Before I decided to use a storage battery I made one with which to test the primary battery. I reasoned that if I could get a primary battery that would form and keep charged such a secondary battery, that it would do the work necessary for practical work. Having found a storage battery that I thought reliable, my next endeavor was to find some means of charging and keeping it charged.

A bichromate battery was out of the question, as that lasts but a short time on a short circuit, and the care of such a battery is unbearable. The common crow-foot, or such as is used on telegraph lines, is very dirty, gives only a small quantity of current, and unless a large number be used, would not keep the secondary battery charged sufficiently for practical use. I had read of a battery made in Boston that was rated to give about double the quantity of a common gravity battery, was clean, and needed but little attention. I looked it up, and found it a combination of the Daniel and crow-foot. The inventor, Mr. Gethins, said he felt confident that it would do the work; kindly put the volt-meter and ammeter into the circuit of some batteries that had been at work for some months, and after seeing the readings thought the experiment worth trying. Ordering enough to charge one cell, I at once made a small storage battery of plain lead-plates, and commenced forming them. The secondary cell was a very small one, not over two and a half inches square, but in about twenty-four hours there was power enough to make an eighth of a horse-power motor go several minutes, and in about two weeks it would run about twenty minutes, which was the capacity of the cell. This satisfied me that power enough could be obtained from a primary and storage battery to run a dental engine for practical use. The motor received my next attention. It was necessary to use as little power as possible, and a motor must be had that would run with the greatest economy. There are two ways that power is manifested in electricity, as in water,—viz., volume and pressure. If you have volume, you do not need pressure, and *vice versa*. The word volt means pressure, and ampère means quantity, in electrical nomenclature; and to give you an idea as to the relation of quantity and pressure, I will say a motor running on the Edison system takes one hundred and ten volts and about three-quarters of an ampère; a motor using the arc-light circuit would use twenty-five hundred volts and from seven to nine ampères. The motors in use on the street railroads are wound for six hundred volts and any number of ampères up to one hundred and fifty, and possibly more. I have seen the readings taken from the street roads, and they were from twenty to one hundred ampères. It is easily understood from what has been said that a motor can be wound for quantity or pressure, or both. In the use of a storage battery, if a motor is wound for volume or quantity, and the battery is a small one, it would take but a short time to exhaust the amount of electricity which the battery contained. If, however, it is wound for pressure, and not for quantity, the battery is drawn upon very

slowly. Each storage cell gives a pressure of two volts, and is made to deliver about four hundred ampères. They can be much larger, but would be very heavy to handle. The cells which I use are thirty-five ampère-hour; that is, they will give one ampère thirty-five hours, or two ampères seventeen and a half hours, and so on, till about one-sixth of the capacity of the battery is reached, as it is not well to discharge it faster than one-sixth of its rated capacity; if this is done, the paste is in time forced out of the positive plates. Motors are wound for two volts and upward, but the number of ampères which they take is doubtful (I am speaking of battery motors) unless you have some means of measuring the amount as it is used. I found it necessary, therefore, to obtain an ammeter, and ascertain the amount of current different motors absorbed. Without detailing my work, I will say that I found a motor that required four volts and eight ampères loaded to its greatest capacity. This was within the range of my battery, and has proved more than satisfactory.

Having the storage battery and motor right, it only remained to get enough primary battery to keep the secondary fully charged. Having four volts' pressure in the secondary, it is readily understood that the primary must have a greater pressure in order to force the current into it, and the charging current should have a pressure of two and a half volts to each secondary cell; consequently, for two cells we must have at least five volts, and in the use of a battery I have found that six is more satisfactory, for the reason that the cells of primary do not give quite a volt each. In regard to the quantity, if an arc-light current is used it will be about nine ampères; but in using the incandescent current, from twenty to thirty ampères is generally used, according to the size of the accumulator, the time taken for charging being about seven hours.

Now, a battery gives a very small quantity compared to a dynamo, and it is found necessary to keep the accumulator in circuit all the time; therefore, we must have a battery that will work on a closed circuit without becoming exhausted; this we find in the common gravity, or, as it is called, crow-foot, and the Daniel cell. As I have explained, the former is very dirty, and gives only about one-third of an ampère, while the Daniel cell, if kept in closed circuit, causes the porous cup to become coated with copper, thereby reducing its efficiency in the matter of quantity. As yet no battery is perfect; an ideal one would run indefinitely without attention; we must take the one which approaches the nearest to what we desire, and in the Gethins we get very near it, giving, as it does, double the quantity,

to say the least, of a gravity; is clean, and requires little attention. By using twelve cells of the Gethins battery, connecting them to give six volts, or two in series, we get nearly six volts, and from one to one and a half ampères, enough to keep the storage battery charged (if kept in circuit all the time) and run the engine, mallet, and mouth-lamp, if desired. I have had my motor running for two years constantly, without its once failing, and the batteries are as good as when first put in. There is almost nothing to do to the accumulators; once in six months, perhaps, a little water has to be added to make up for evaporation,—that is all. The primary needs a little more care. If the room in which they are kept is warm, it is necessary to put, once a week, a little water in the porous cups, and as the copper sulphate is exhausted at the end of two months, that has to be renewed at that time.

If the entire battery is renewed at one time, it takes about an hour to do it. I find it most convenient to replenish two or four cells at a time, and in a day or two, when I have a few moments, treat others; in this manner the battery is kept in good condition, and the time spent on it is, to me, not noticed.

The space occupied is small; there are no fumes, absolutely no odor, and nothing about it to stain the hands. It seems to me necessary to have the battery near plenty of water, and where it would be under frequent inspection; by having it thus arranged one would take better care of it than if it were in some secluded place, likely to be forgotten so long as the motor would go. It is necessary to bear in mind the fact that the charging of storage batteries is the hardest work a battery is called upon to do; we cannot possibly get power without the consumption or the decomposition of something, and it is observed that the zincs are decomposed and waste, leaving a residuum in the porous cups which has to be removed. Also, the water in the cups becomes saturated with zinc, and the battery does not work quite as well in consequence; for this reason I find it better to occasionally wash out the porous cups with cold water; this can be done at odd moments as the occasion demands. My own batteries are in a side room, about fifteen feet from the chair. If it is necessary to have them at a distance, I think the storage batteries should be near the motor, using a large size of wire not less than No. 12, better 10, from the primary. By so doing there is no loss from the storage to the motor. I also keep a tangent galvanometer, which any one can make, in the circuit, from the primary to the secondary; this shows at a glance if the battery is in a good condition. In making the galvanometer it is necessary to use a large

wire or strip of copper, so the resistance shall not be greater than the conducting wires. All connections should be perfect; if anything is wrong it is more likely to be the connections than anything else. The circulars which are sent with the batteries give directions as to their care, which is embodied in what I have said.

Since the storage battery has become an undoubted success, and it has been learned that they can be charged by means of a primary battery, there have been a great many batteries put upon the market for the purpose of charging them, but they are failures, and to-day, so far as I can learn, the Gethins is the only one that stands for the work for any length of time without giving out. Others show well for a few days, but rapidly fail and have to be renewed, as does the bichromate-of-potash battery. The law of compensation holds good here as elsewhere; if there is developed a large amount of current, it is at the expense of something, and that something is in this case the battery elements or solution. While the Gethins does not give a great quantity of current, it gives what it does produce for a long time, and without attention. This can be easily stored and used as wanted.

It is also better to connect two in multiple than have the twelve in series, as it is found this arrangement prevents the rapid consumption of the zincs, which takes place where they are in series. The primary must be a little in excess of the storage, but not too much. If it is, the primary is more nearly on a short circuit, and that means rapid consumption of the zincs. I have been asked why not have a larger storage battery to give a larger quantity in number of hours which the battery would run the motor; the reason is this: the thirty-five ampère-hour cell is large enough to run the engine all one wants to in a day, and if it were larger the primary would not fully charge it. If a storage battery is kept partly discharged all the time the plates are injured; in fact, in time ruined; therefore it is necessary to have the accumulator small enough for the primary battery to keep it fully charged, which is the best condition for a secondary cell or cells.

It may be of interest to some to know why I use the Sorley storage battery. I think it the only one on the market that is reliable, and, from what I have seen of others, the only one in which the plates will not warp, and from which the paste will not fall out. The trouble with accumulators has been from short circuits in the battery itself, caused by the warping of the plates and the falling out of the paste; the plug getting between the plates causing local action and the exhausting of the battery. I have seen a number of

such cases, the battery doing good work for a time, then gradually failing, and at last becoming worthless. Such a battery in the hands of one not posted on the work of accumulators would probably be cast aside and pronounced useless, or the owner would be at quite an expense for repairs, and in the course of time the same thing would be repeated. In making one from lead-plates great care must be taken to arrange the plates so they will not warp or become short-circuited by the sediment which falls to the bottom of the jar in all kinds of storage batteries. You will see by the samples which I have brought that the plates do not touch the jar at the bottom, and the powder that comes out cannot lodge anywhere, but must fall to the bottom. Another is what is called sulphating, or the formation of the higher sulphates on the plates; this is, I think, more likely to take place where the secondary battery is charged with a primary than where a dynamo is used, and is indicated by the formation of white spots on the plates. I find the best way to remove such formation is to rub it off with a thin stick, on the end of which is wound a piece of string that will easily pass between the plates.

The elements are lifted out of the acid and washed, then the white deposit is easily rubbed off; it can be removed by overcharging with a strong current, but I have not succeeded in taking it off with a battery. Any considerable quantity of this sulphate should not be allowed to form, for, once started, it will grow like a fungus, and in time reduce the efficiency of the battery very much. As a matter of fact, I think that the accumulators are always overcharged at the stations, a practice which keeps them in good condition; this is not easily done with a battery, unless more battery is used than I employ. The voltage is enough, but there would need to be three in series instead of two, making eighteen in all. When a battery is fully charged it will boil, and by putting the ear to it the liberation of gas can be distinctly heard; if the elements are in glass this process can be seen. The connection between the cells should be particularly good, and if the cells are moved, it not infrequently happens that they are broken, and the motor will not go, on account of this slight disturbance. It occasionally happens that the power is not quite up to standard; the batteries seem all right, and you wonder what the matter is; at such times it is well to see if the brushes on the motor are in the right place; as they become worn they wear back from the most effective point, and should be moved forward to their original position on the commutator, which is easily found by making connection with the

lowest speed, and moving the brushes to that point where the motor runs the fastest. All bearings should be kept well oiled, as there is no surplus power to be wasted in unnecessary friction, and it is much better to have rubber bands on all pulleys; this will allow the belt to be run very loose, at the same time giving full power. There is no possible means of getting or giving a shock; the speed can be made very much slower than any motor that I know of; may run from a street-wire (a very desirable feature), and the power is not so great that there is any harm done if anything gets caught. It is always ready; the power is more than enough for anything one can do with the engine; in fact, will run the lathe, if the stones are not over one and three-quarters of an inch in diameter; and the cost of running is about seventy-five cents a month. I have placed my motor and rheostat on one base, taking up no more room and weighing no more than the engine. It can be moved to any place by having the flexible wire long enough, and when not in use is pushed to one side, same as the engine. I do not claim that it is better than the current from the street, but I do think it is just as good, barring the care of the battery, which to me is very little trouble. From what has been said do not for a moment think I desire to urge any one to purchase this outfit, because I have obtained so much satisfaction from it. I know perfectly well that what one man finds a convenience, another rates as a nuisance; but if one will spend as much time on the battery as in keeping other instruments in order, the labor of dental operations will be greatly lessened.

DENTAL EDUCATION.[1]

BY W. XAVIER SUDDUTH, A.M., M.D., D.D.S.[2]

THE question of the relation of dental colleges to the State laws governing the practice of dentistry in the United States has received considerable attention during the past year. It seems to me that nearly all who have taken part in the discussion have viewed the subject in the wrong light. Instead of its being the State laws *versus* the colleges, it is the colleges, or a part of them at least, *versus* the laws.

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[1] Read before the American Academy of Dental Science, April 6, 1892.

[2] Dean of the College of Dentistry of the University of Minnesota.

The impression has gotten abroad that all the colleges belonging to the National Association of Dental Faculties are united in the opposition now being hurled at the State boards of dental examiners. This certainly is not the case in Minnesota. The law has no warmer supporters in this State than the Faculty of the College of Dentistry of the University of Minnesota. How many other colleges in the country look upon the question in this light I am unable to say, but I think that when the attitude of the different schools is canvassed it will be found that not a few are in favor of wise legislation on the subject. I do not think that the members of the boards should be brought into the discussion at all, except where it can be shown that they are not doing their duty. They are simply officers of the law, and have no option but to enforce it to the best of their ability, and they should have the hearty support of the people who enacted the law. As a rule, they are conscientious, capable men, who perform a thankless task at a considerable sacrifice both of time and means. From personal knowledge I know that such is the case with the members of the board in Minnesota. Feeling the injustice of much of the criticism passed upon them, we took occasion in our last announcement to state the position of our school in no uncertain language, as follows:

"The Faculty of this college recognizes the right of each State to control the practice of dentistry within its borders by regularly appointed boards of dental examiners."

There would be just as much injustice in abusing a policeman who should arrest you for breaking a well-known city ordinance, such as fast driving, for instance, as to blame the members of the boards for executing the law as they understand it. It is the law, then, that we have to deal with, and not the State boards.

What is the history of the enactment of the laws found on the statute-books of nearly all the States at the present time? It has been one of self-defence in nearly every case, for as time went by States without laws found themselves "becoming the dumping-ground for the charlatan and the ignoramus who had been driven out of other States." The enactment of laws governing the practice of dentistry in a few States forced all the rest to legislate against empiricism as a matter of self-defence.

As the standard of dental education has advanced, the laws enacted have, in most cases, become more rigid in their requirements, and many that passed laws early in the history of dental legislation are now finding them inoperative, to a greater or less degree, and are seeking to amend or entirely replace them. These laws are

ssed for the protection of the people, and not for the interest of ntists or dental colleges. A few of the States, recognizing the lue of a college education, have thrown such restrictions around e privilege of examination as to debar all but college graduates om availing themselves of it; the medical law in Minnesota states plicitly that none but college graduates are admissible for examation, and prescribes the length of course which must have been rsued; while the dental law allows a little more leeway, yet it es virtually the same thing by making the time of credit for actice an increasing one from the date of the enactment of the w, which will in time debar all but college men from entering actice in the State.

New Jersey has also placed a premium upon a college education, d a large proportion of the States, in accepting college diplomas r registration without examination, have acknowledged the value college instruction.

All these advances have been made by the several States volunrily, under the impression that the colleges would appreciate them d fulfil the trust bestowed in them. The administration of the w in States that require all candidates to pass an examination has own that not all incompetents were non-graduates, fully as large proportion coming from the so-called reputable colleges.

It was found that a very large proportion of men presenting ith diplomas were not, in the judgment of the members of the ards, safe men to intrust with the care of the mouths of the izens of their State. The result has been wide-spread distrust the honesty of the intentions of some of the colleges, and a owing impression that the only safe way to guard against the mission of incompetents is to require all candidates to pass an amination before being granted a license to commence practice.

What has brought about this change in the attitude of the State vs towards the colleges? Nothing else than the flagrant abuse of confidence which was at first shown in the colleges. They are w only reaping the reward of a betrayed confidence. The seed distrust has, however, been sown, and will, under the same law self-defence which caused the enactment of the laws in the first tance, require the amendment of existing laws until all the tes will require all candidates to pass a test examination. Thus the many made to bear the sins of the few.

Should such a condition come to pass, it would be nothing more, wever, than is required of our sister professions; laws for the trol of the practice of law even more rigid than have been estab-

lished in any State for the practice of medicine or dentistry have long been on our statute-books. Graduates of all our law schools must, after graduating, pass an examination. They must, in addition to legal fitness, possess and maintain a good moral character, or they can be "disbarred" at any time. If they desire to remove, they must obtain a certificate from the court before which they were admitted to practice for registration in another State. If they desire to practise in the Supreme Court of the United States they must sustain a good reputation for a specified time, and then pass a second examination to show their fitness for the higher courts. We hear nothing from Columbia, Harvard, or the University of Pennsylvania about the non-recognition of their legal diploma, and why should such an outcry be made against those States that see fit to require college graduates to pass an examination before granting them licenses to practise dentistry?

If a graduate of the College of Literature and Arts of Princeton, Yale, or the University of Pennsylvania desires to teach a district school in the backwoods in Illinois, he is required to pass an examination as to his fitness to do so before the county superintendent of schools, which must be repeated every two years. It is true that he may pass the State examination, which will give him immunity for five years, and still we hear nothing from their *alma mater* in behalf of these much-examined candidates who thus enter into competition for a share of the public funds. If, then, a legal or literary diploma does not carry any power to license the possessor to practise, teach, or preach, why should a dental diploma authorize its possessor to practise dentistry in any portion of the United States he may fancy, and become a perpetual license at that as some would have it? What is there in dental education that makes a man non-amenable to the laws of the State in which he desires to practise? The situation is unique and plainly absurd on its face. There is no reason in asking that graduates in medicine or dentistry should be granted favors that are not accorded to law or literary graduates. Both the latter professions afford much greater opportunity for injury to the people than does the former.

If a man wants to employ a lawyer or a teacher, he can take his time to inquire into their qualifications, but if he gets sick or has a toothache, he has, many times, to employ the first one at hand and trust to luck for the results.

In that degree that a profession has to do with the public weal so should the restrictions of law be thrown around its practice. A medical or dental diploma should represent the standard of educa

ion in the institution granting it, the same as a law or literary iploma, and no more. It should not carry with it the license to ractise outside of the State in which the institution is located, and ere in Minnesota we do not ask even that, but require graduates f the University to pass before the State Board just the same as ther candidates, and, what is more, we find it beneficial in that it elps us to maintain a high standard in our own college.

To grant more than exemption from examination to its gradutes in its own State would allow an institution to set the standard f education in other States, and would be in distinct violation of he right of each to control its own internal affairs. This privilege s one of the most cherished rights reserved to each State as it enrs the Union. It has called forth more discussion than, perhaps, ll the other clauses of the Constitution. More eloquence has been pent and more legal acumen brought to bear upon it than any uestion relating to State comity. There is no question that is uarded by the State more jealously than the right to regulate its wn internal affairs, none that its citizens would sooner shed their lood for, except, perhaps, to defend the nation's interest. The close crutiny and the legal discussions that have been handed down in ne past have so defined its powers and limitations that it hardly eems possible that a break could be made in the claims made by the everal States in this direction.

A quite recent decision in the United States Supreme Court earing directly upon the point in hand was handed down in the Original Package" discussion. In this case certain parties doing usiness under charters granted by the State of Illinois tried, under ne head of "Inter-State Commerce," to force the sale of high ines and whiskeys in the original packages on the market in the tate of Iowa when the people of that State had said by legal enctment that they did not want them. This was the last strongold of the opposition, and unlimited means were expended by these ealthy corporations to gain their point. The decision was, howver, adverse to their interests, the Court holding that the State f Iowa had not only the right, but the power, to control the liquor affic within its own jurisdiction. Various other attempts have een made within the past few years under the same head, but inariably with the same result. The motive in each instance has een a mercenary one. Strong corporations have been willing to verride the will and the good of the people in order that they ight make a few more miserable dollars.

Let us see if we can find a parallel in the case in hand. Certain

colleges doing business under charters granted them in the States in which they are situated find that the people of other States, for their own protection, are enacting laws that interfere with their business of producing dentists, in that said laws place a restriction on the absolute free entrance of their graduates into said States for the practice of their chosen profession, and they therefore threaten to force these States to give up their inalienable right of attending to their own internal matters, because in so doing they have run counter to the interests of a few private business corporations.

In what way have the laws interfered with their business? They have only said that the quality of the product of dental colleges, like that of other institutions, say creameries, must reach a certain grade or else it cannot find place on their markets.

Do the laws anywhere prevent the entrance of thoroughly qualified dentists into practice? Not in a single instance; on the other hand, such are heartily welcomed. If such is the case, then the inevitable result of the operation of dental laws will be to send a student to those institutions that can assure him such preparation as shall fit him to pass the dental board of the State of his choice, otherwise his diploma, obtained "at so much cost of time and labor," would be "worthless so far as permitting the holder thereof the right of practice." This would certainly be the case unless the individual could demonstrate that he was possessed of the qualifications which his diploma claims for him, and if he had them in his head and at his fingers' ends, it surely would be no great task for him to prove to any State board that he was really the individual named in the document. To do this would not require more than a few hours' time, and would surely be worth the effort just to get the signature of the secretary of the board, who is a legal representative of the law.

From some of the discussions on this question it would seem that there is doubt as to the "keeping qualities" of the product of some of our colleges. Granting that it is "A No. 1" when put out as shown by the document duly signed and sealed that is sent with each package, it might be well to establish a system of "rapid transit" from the "diploma mill" to the offices of the State boards in the several States; and as the product in some instances seems very likely to deteriorate in transit, as has been shown in the case of our own State examinations, where as high a proportion as five in nine failed to pass inspection, it does seem that it might be well to establish a system of "refrigerator cars," and for the moral influence it may have label each separate consignment "Original package."

But, jesting aside, the question as I look at it, when stripped of all prejudice, has a purely business aspect, to which let us turn our attention for a moment and see what light we can gain thereby. The strongest opposition to the enactment and enforcement of State laws governing the practice of dentistry is found in those schools that hold their charters as "private institutions," and who look upon their "plant" as a "vested right." They are in the business of turning out dentists, and they naturally desire to do so at the least expense possible, consequently are opposed on "business principles" to all State regulations that look towards the elevation of the standard. They went in with the rest for a three years' course because that played right into their pockets. Students must now remain one year longer in attendance, which means more time in the infirmary and an additional year's fees. But to raise the standard would require a selection of the material to be taught and better facilities for instruction, all of which would increase the expense and lessen the profit. The rejection of poor material by a higher entrance examination would lessen the number in attendance, and consequently cut down the *profits* of the infirmary. Then again, improved facilities would incur considerable expense, which would have to come *directly out of the profits* of said infirmary.

The plain statement of the facts of a case are never agreeable to all concerned, but it does seem to me to be about time to draw a line between the really professional schools and the "dental infirmaries." Exposures are never pleasant tasks, but when it is currently reported that one institution cleared sixteen thousand dollars in its infirmary during the session of 1889–90, and twenty thousand dollars in 1890–91, and that another reached the fabulous sum of thirty-six thousand dollars for 1888–89, and with the same management and an increased attendance of students in 1390–91 there was, in all probability, a proportionate increase in infirmary receipts, it does seem time that some one should call attention to the subject. Many other instances of the abuse of the dental infirmary might be cited, but these well-authenticated cases will suffice for my purpose.

I do not think there is any risk in saying that the cause for most of the opposition to State dental laws at the present time lies in the pernicious influence of our dental infirmary system. A mercenary spirit has crept into our colleges through the "open door" of the infirmary, in many instances completely overshadowing the primary object for which they were established.

A close analysis of the opposition to State dental laws will show

any fair-minded man that the strength of the opposition bears a very close relation to the size of the balance-sheet of the infirmary of the college. This is quite natural, as the larger the profits the more at stake, and also the greater amount of ready cash on hand with which to obstruct dental legislation. In some instances this has not been confined to the bounds of their own State, as some institutions have gone outside and used means to prevent the passage of laws which the people of a sister State had framed in its interest, because the enactment of such laws would, to a greater or less degree, be inimical to the interests of said colleges.

The remedy for the situation lies in supporting just laws in every State in the United States. It is not essential that these laws should be uniform. Uniformity means a compromise, a lowering of the standard, and would militate against progress. Let each college do its duty by its students and come to the standard set by the most rigid law, and there will be no more need of complaint. It is impossible to harmonize the differences between the colleges and the State boards in any other way. The members of these boards have no option in the matter. It is their duty to execute the law as they interpret it. It has been said that at the meeting at Saratoga last summer the National Association of Dental Examiners "refused absolutely to be a party to any compromise." What else could they have done? They did not make the laws. What would "perfect unison" in such a case mean other than that the officers of the law had conspired to defeat the wishes of the people as expressed in the law? It has also been said "that a truce has been arranged for the present;" said truce is, however, only a "recommendation," and not mandatory upon the boards of the several States. The Board of Dental Examiners of the State of Minnesota has been compelled to send its resignation to the National Association because it could not comply with that portion of the recommendation referring to a partial report of the work of the board, our law being explicit on this point and requiring a full, detailed report.

I cannot see wherein "the interests of all are jeopardized by the present antagonistic position," as is held by some. I am sure the State boards can stand the antagonism. They have nothing to fear. So long as they faithfully perform their duty the people will stand by them, and if much more opposition is made to the execution of the law so as to increase the labors of the boards, they will vote them an increase in salaries. Outside opposition is the strongest argument to the people of the necessity of dental

legislation. On the other hand, only good to the dental profession can come from a free discussion. The attitude of the different colleges will be shown, which will, in the end, work to the elevation of the standard of dental education. Some very plain words will pass before the question is settled. It is needless to look for any compromise steps to be taken by the States in the matter. The colleges might just as well accept the situation at once and take such action as will put them in harmony with the law. The interests of the many cannot be sacrificed for those of the few. I consider that the future is bright for the scientific advancement of dental education in this country.

SILICA: ITS CURATIVE ACTION IN THE TREATMENT OF ALVEOLAR ABSCESS.[1]

BY CHARLES H. TAFT, A.B., D.M.D.

THE subject which I wish to present for your consideration is, in my opinion, an important one; not because I consider the remedy by any means a specific for the general treatment or cure of alveolar abscesses, but because I consider it to be a remedy which, when used with intelligence, will be found to be as useful in the hands of the dentist as it is in those of the physician.

There are probably few among us who do not frequently have cases in practice that seem to call for systemic rather than for surgical or mechanical treatment. When, for instance, pathological conditions are brought about by a disturbance of the vital force, resulting in an abnormal functional activity of an organ or tissue, and when we are called upon to prove to the patient that we have both the knowledge and ability to correct and to overcome such disturbances and thereby to disprove the all too prevalent idea in the public mind of to-day that dentistry is even yet but little better than a tooth-pulling, or even a tooth-saving, art.

Common among the every-day cases coming to us for treatment are alveolar abscesses, the etiology of which we are, of course, familiar with, and concerning which nothing need be said. They are commonly divided into two classes,—the acute and the chronic

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[1] Read before the American Academy of Dental Science, Boston, April 6, 1892.

forms; the former being such as easily yield to treatment, the latter being such as do not so readily yield. It is this latter class that I wish particularly to consider, and to show how far the suppurative process can be materially modified and controlled, if not, indeed, made to disappear entirely.

To illustrate, permit me to cite a case in practice which I can safely assert has been the most obstinate, with one exception, in yielding to treatment that I have ever had to deal with.

On February 23, 1891, Miss B. presented herself at my office complaining of severe pain in the right inferior second bicuspid, a large corono-mesial filling having been inserted a year previous by a dentist abroad. Upon examination the pulp of the tooth was found to be dead. It was then thoroughly removed and a dressing applied, the cavity being temporarily sealed with gutta-percha. She presented herself the following day with her face badly swollen, and the process of suppuration had advanced to the stage which made the lancing of the abscess a simple and easy matter. Both gutta-percha and cotton dressing were then removed and the cavity allowed to remain open for a few days until the swelling had entirely subsided and a fistulous opening had become established, which appeared, rather curiously, on the hard ridge of the alveolus directly behind the tooth (the sixth-year molar having been previously removed), rather than opposite the extremity of the root, where we should naturally expect to find it.

At the following sitting all traces of pulp-tissue and débris were removed from pulp-chamber and root-canal, and a cotton dressing dipped in creolin applied and temporarily sealed in place.

At the next sitting the dressing was found to be absolutely clean and sweet, and the fistulous opening, instead of healing up as was to be expected,—the exciting cause having been removed,—grew larger, the tissue directly around the opening assumed an angry bluish-red appearance, and the discharge of pus was sufficiently large to be at all times noticeable and very annoying to the patient. A large-sized probe could be easily carried along the fistulous tract to the apex of the root.

Renewed efforts were made to effect a disappearance of the abscess by treatment directly through the root-canal and the fistula itself.

Resort was had to a method which I have on previous occasions found very satisfactory in obstinate cases,—namely, that of passing a very sharp burr along the fistulous tract and cutting away the sac attachment so far as possible from the apex of the root, after-

rards syringing it out with a strong solution of peroxide of hydro-
en, followed by a weak solution of carbolized water.

The patient presented herself frequently from February 23 to
ctober 3. Upon each occasion the dressing previously applied
as found to be without the slightest trace of odor other than its
wn, while the fistulous opening remained the same, with the same
gly, inflamed appearance and copious discharge of pus.

Both patient and operator were beginning to get somewhat tired
f the slow process of healing, and at last I frankly confessed that
had exhausted all the known dental means and methods with
hich I was conversant for the treatment of alveolar abscess, and
emarked that I thought it was now time to see what medicine
ould do in the case. The tooth had, in the mean time, become
uch discolored, but, aside from the annoying discharge of pus,
as of no discomfort to the patient.

With a knowledge of the physiological and medicinal action of
lica, and its remarkable control over the suppurative process, the
atient was given six powders in the two-hundredth potency of
ie drug, with instructions to take one powder dry on the tongue
very night before retiring, and at the end of a week to come in
nd report. At the expiration of a week she presented herself, and
here was visible a very decided improvement in the appearance of
oth fistula and the parts around it, as well as a very marked de-
rease in the discharge of purulent matter.

The patient remarked that the improvement began to be
nmediately noticeable the day following the taking of the first
owder. The same medicine was then repeated, with instructions
o take as before, and at the end of a fortnight to come in again
nd report.

The next visit showed a continued improvement. The inflam-
ation was slowly but steadily subsiding, likewise the flow of pus,
nd it required a much smaller-sized probe to be passed along the
act. No further medicine was given, but the patient was in-
ructed to report at the end of another week.

The following visit showed still further improvement, and at
rst sight the fistula had apparently entirely healed, much to my
tense gratification. It had by this time become so small that
ithout knowing its exact location its existence, to a casual ob-
rver, would have been not easily discernible, but upon applying
essure upon the ridge a small discharge was seen to emanate from
ie opening, and a fine probe could still be passed along the entire
act to the apex of the root.

At this stage of treatment the silica was dropped for the tim being and causticum given, and following that, a week later, fluori acid; these also in the two-hundredth dynamization.

No perceptible change or further improvement was visible fron the effect of either of these drugs, and the patient reported tha the medicine had been without apparent effect, unless it was to con tinue the improvement which the first medicine had effected. Sh reported further that the discharge had been so slight as to b noticeable only upon pressure.

Feeling confident that the first selection of the medicine giver had been the right one, there being an absolute lack of contingen symptoms to point to any other drug as being the similimum o their totality, and of which there is generally a greater or less number when the case is one that calls for systemic treatment; and knowing also that the curative power of a medicine when homœopathic to the case is greatly increased in proportion to the reduction of the dose to that degree of minuteness at which it will exert a *gentle* curative influence, I again went back to the silica, this time giving it in a much higher potency—the one-hundred-thousandth—and in the divided dose; that is to say, dissolved in water. The patient was instructed to report in a week, but three or four elapsed before she presented herself. The medicine having done its work so well, she had hardly thought it necessary.

This time, to my great satisfaction, as well as to the patient's, the discharge was found to have entirely ceased. The tissues had completely reassumed their normal color and appearance, but the tract still remained; so minute, however, that pressure failed to cause the appearance or further discharge of offensive matter. No further medicine was given and the patient was dismissed.

On March 8 the patient called to inquire if the tooth could not be permanently filled, not the slightest discharge having been noticed since her last visit, two months previous. The tract still remains, very minute as before, but no discharge can be made to come from it in any way, shape, or manner.

What, then, has been accomplished? In the first place, there was a localized disturbance or change in the vital force, brought about by a specific cause, resulting in a perverted nutrition and abnormal functional activity of both the organ itself and the tissues in relation thereto.

Secondly, all surgical efforts having failed to bring about a restoration to health of the parts concerned, and the case then seeming to be one pre-eminently calling for systemic treatment, a remedy

was selected whose value and power in controlling the suppurative process is well known to those who practise medicine in accordance with the teachings of Hahnemann, and which, in cases of simple abscess, has a brilliant clinical record.

Thirdly, in this, as in the process of any homœopathic cure, to quote the words of Hahnemann, "by administering a medicinal potency chosen exactly in accordance with the similitude of symptoms, a somewhat stronger similar artificial morbid affection is implanted upon the vital power deranged by a natural disease. This artificial affection is substituted, as it were, for the weaker similar natural disease (morbid excitation), against which the instinctive vital force, now only excited to stronger effort by the drug affection, needs only to direct its increased energy; but, owing to its brief duration, it will soon be overcome by the vital force, which, liberated first from the natural disease, and finally from the substituted artificial (drug) affection, now again finds itself enabled to continue the life of the organism in health."

From what I have stated the impression may go forth that equal success in the treatment of alveolar abscesses might ensue from the indiscriminate employment of this drug as a sort of specific in all forms of this pathological condition, but this is by no means the case.

It would be both interesting and profitable, were it within the limits of the paper, to consider the action of other medicines equally valuable in the treatment of abscesses, and to show why a remedy would prove effectual in one case and totally ineffectual in another; but for the proper selection of any remedy in a given case the fact should not be lost sight of that a knowledge of the physiological or toxical action of a drug is, in the first place, most essential. By this I mean we must know what pathological conditions are brought about when a proving of the drug is made upon the healthy human organism: what tissues are affected, and in what way they are affected; for it is only by comparing the symptoms of your patient with those which different drugs produce upon the healthy body that a correct or scientific knowledge of their curative action can be obtained. Without this knowledge one would wander blindly in making his selection of a remedy.

To some of those who may be unfamiliar with the great number and variety of medicines to be found in the homœopathic materia medica, it may appear incredible or absurd that a substance which in its native form is simply the pure silica of quartz-crystal, and which in its crude state is but an inert mineral substance, can

have any medicinal action; and not less incredible and absurd when administered in the potencies I have described. But it is only after such a substance has been triturated with a non-medicinal substance, a process whereby its molecules become comminuted or broken up, that its medicinal properties are evolved. The different potencies of the drug being then carried up by the fluid process or succession, the higher the potency the more powerful its action, and the greater care and discretion in consequence to be exercised in their use.

The action of the drug we are considering is a slow and deep one,—the nutrition of the tissues which come within its sphere of action rather than their functional activity being especially influenced by it, and by reason of its slow action is suited to chronic rather than acute affections. But it is in cases involving profuse suppuration that its value as a therapeutic agent is especially appreciated, where abscesses can be made quickly to come to maturity and the secretion of pus either modified or brought entirely under control.

I have heard it stated by men prominent in our profession that medicine is not and never can be an *exact* science. To this broad statement I feel compelled, through convictions established within me based upon evidence and experience, to take exceptions.

It is not my purpose, however, to encourage discussions of a general character at this time upon what properly belongs to another subject, and upon which much has heretofore been written and said; but speaking for myself alone, and as a dentist who believes most assuredly that medicine (or if I may be allowed to qualify the word by substituting homœopathy) *is* an *exact* science, not a speculative theory; a principle, a law of nature as universal in its application as any of the natural laws which govern the universe; and that dentistry is, or, at least, should be, in a broad sense, a specialty *of* medicine. I cannot conclude my remarks upon the subject before us better than to express the satisfaction I daily find in applying a rational and intelligent knowledge of the materia medica, so far as I understand it, in the treatment of such organic or functional disturbances as properly come within our province as dentists; and where the use of the ordinary and rather limited number of dental therapeutic agents at our command prove either only temporarily useful and satisfactory, or, what is often found in the long run to be the case, wholly unsatisfactory and therefore largely useless.

ARGENTI NITRAS AS A REMEDY IN THE TREATMENT OF PYORRHŒA.[1]

BY DR. E. H. STEBBINS, SHELBURNE FALLS, MASS.

THE value of remedial agents depends largely upon their continued good effects. Agents that are readily diluted or wasted by the fluids of the mouth are necessarily evanescent in their effects, and must be frequently applied in severe cases. No one remedy is best in all conditions. A splint that is sufficient to hold in place an infant's broken arm is wholly inadequate for a man's broken leg.

It is not the purpose of this paper to discuss remedies for incipient or mild forms of pyorrhœa, but those cases where other remedies have been ineffectual, and the disease has progressed till hope is nearly or entirely gone.

We recollect the late Dr. Riggs, of Hartford, and his treatment of pyorrhœa. His work in this line had a very good effect upon the profession in calling attention to the necessity of removing all and every particle of calcareous matter from the roots of teeth. Doubtless all of us can recall cases treated by him, or others, where the operations were performed as thoroughly as it seemed possible, and yet the deposit and accompanying pyorrhœa returned, and the same process must often be repeated.

How many patients have we to-day whose gums give us and them more annoyance and solicitude than their teeth do? How exasperating to our pride when, in spite of all our efforts, we are obliged to let a highly-esteemed patient lose one after another of his or her teeth!

It is not claimed that argenti nitras will cure *all* cases. It will not raise the dead. The long-continued good results of this agent in treatment of pyorrhœa of the gums is probably due to the compound formed by it with the organic substance of the cementum. This product being a powerful germicide, and held in close proximity to the diseased portion, is a perpetual and deadly foe to the microbes.

For the effects of the salts upon tooth-substances reference may be made to my paper published in the INTERNATIONAL DENTAL JOURNAL, October, 1891, and in the *Ohio Journal of Dental Science*, March, 1892.

The first effect of an application of the salts to purulent gums

[1] Read at a meeting of the New York Odontological Society, May 17, 1892.

is to turn them to a whitish color. The cauterized portion will slough in a day or two, leaving the remainder in a healthy condition. Cases where a slight pressure against the gums produced copious discharges of pus about the teeth have been treated once, and in a few days the whole appearance of the parts was found to have been changed, and to sustain hard pressure without causing any discharge of pus. Instead of the soft, fluctuating condition of the gingival border, the gums have presented a hard and apparently healthy condition. Where the teeth are very loose they become more firm in their sockets. Patients express with much satisfaction their appreciation of the results, and say their teeth and gums "feel so much better."

How long do the results last?

Case III., page 666, INTERNATIONAL DENTAL JOURNAL, October, 1891, has been under my observation since the first treatment. It is safe to say that since then the calcareous deposit has not been five per cent. of what it was before. Occasionally it has been necessary to retouch some places where the black crust has been worn off by his artificial denture, or some other cause. Recently gingivitis appeared by three teeth in different parts of the mouth. Upon pressure pus exuded. Some tartar was removed from deep down on the roots of the teeth, and the salts applied. Pyorrhœa and inflammation soon ceased.

Case IV., page 667, INTERNATIONAL DENTAL JOURNAL, has recently had tartar begin to deposit on the inferior incisors and the gum by them to be inflamed. This case has been over four years without any treatment. Other parts of the gums aside from that just mentioned are in very good condition, and there has been no deposit of tartar compared with what there was before treatment.

Other cases might be related, but they would only confirm those given. No case has come under my observation that did not yield gratifying results.

MANNER OF TREATMENT.

Remove all calcareous deposits from the teeth. (If any one has not extracted a tooth immediately after cleaning it, let him do so, and see how ineffectually the tartar has been removed.) With a slender wood point carry small quantities of the *pulverized* salts down beside the roots of the teeth till every exposed part thereof is touched as well as every portion of diseased gum. Make the application to but a few teeth at a time, so as to be able to keep the spreading of the dissolved salts under control. Keep

ne mouth as free from saliva as convenient. As soon as a few eeth have been treated inject water freely to carry away the surplus issolved salts. Then proceed with a few more in the same manner ntil all are treated. Of course, care should be exercised to protect ll other parts of the mouth. Care and skill should enable any perator to avoid touching the salts on the patient, or himself, where they are not needed. The use of paper napkins or pieces of loth to wipe the patient's mouth will save staining other napkins.

It is a source of regret to me that it is impracticable to have a atient here to illustrate the subject under consideration. Inasuch as there are patients present to show results of treatment for ecay, I will give an account of a case which is of peculiar interest o me.

A young lady (not vigorous in health or constitution) consulted ne in 1885 about the feasibility of saving her teeth. Some of them ere filled, others were decayed. She had been advised to have othing done till it should be necessary to have them all extracted. he was in a dilemma, but accepted my counsel and kept her teeth. ll but seven of them have been filled. In April, 1886, I discovered uite a groove of decay in the central incisors, extending from the ngle of labial and mesial surfaces across the mesial surfaces and round to near the middle of the palatal surfaces. The gum nearly overed these grooves. I applied the salts at once. In January, 889, the left one had begun to decay a little farther along on the alatal surface, and was retouched with the salts. No other symptom of decay has appeared,—more than six years.

A little girl has just been to my office whose teeth I have treated. Over two years ago the distal surfaces of her first temporary molars nd the mesial of the second ones were decayed. To save them till me for them to be replaced by the bicuspids it was necessary to ll or treat them with the nitrate. The latter was done, and they ave been preserved, and will be till it is time to extract them, and at without filling. She has had other teeth treated that have esulted as favorably. The little boy of the same family has been s fortunate in this respect as the girl. The parents and children re very much pleased by the results.

My observations confirm my confidence in the efficacy of this gent. Sometimes I have treated large cavities with the salts, and a subsequent sitting filled them with gutta-percha or cement, ithout excavating.

Are there objections? Yes.

A lady said to me, "If folks only knew what it is, so they would

not think it is dirty decay, it would not be objectionable." Divest the minds of Americans of prejudice, and a clean, healthy dark spot on a tooth would be preferable to a patch of gold. Much credit is due practitioners who inveigh against such glittering displays of the shining metal in the mouths of our people. But there are thousands of cavities out of sight that can be just as well saved by this method as by filling. It so completely fills the requirements for some agents that are adapted to preserve the teeth of children —little children, nervous, timid children,—that it commends itself to the careful consideration of every dentist.

There is no doubt (in my mind) but more than three-fourths—yes, ninety per cent.—of children's teeth that decay can be preserved their allotted time of life if the treatment is begun in season and faithfully followed up. If we charge for value of services rendered, why not get better fees for this than for filling, considering the time it takes? Who would not use nitrate of silver, if by any plausible means a fee of five or ten dollars could be charged for each cavity? I am prompted to say this by the questions so often asked me about fees for it.

When I observe incipient decay in the teeth of a patient I recommend nitrate of silver to arrest its further progress. My advice is usually accepted, and the results are in most instances very satisfactory. Many patients freely express their approval of the treatment. Many times patients ask me what it does. My reply is that "it kills, embalms, and entombs the microbes just where it finds them."

Reports of Society Meetings.

NEW YORK ODONTOLOGICAL SOCIETY.

A REGULAR meeting of the New York Odontological Society as held on Tuesday evening, May 17, 1892, at the New York cademy of Medicine, No. 17 West Forty-third Street, New York ity; the President, Dr. Woodward, being in the chair.

The minutes of the previous meeting were read and duly ap-roved. Professor Carl Heitzmann then read a short paper entitled, Demonstration of the Reticulum in Dentine with Low Powers of he Microscope."

(For Dr. Heitzmann's paper, see page 629.)

Professor Heitzmann.—I must remark that this stain fades. This pecimen was very much plainer than it is to-day. Only experts hould look at this. I had not the slightest idea that the specimens ould fade in glycerin until Dr. Howe called to see me, and then I oticed that they were much faded in appearance.

The President.—Any one wishing to examine the specimens may ow do so, after which the question will be open for discussion.

DISCUSSION.

Dr. Howe.—At Dr. Heitzmann's invitation I went to his labora-ry, and saw in these specimens, very clearly, what he describes as he reticulum. But I do not feel competent to express an opinion to what it is that I see. The specimens are perfectly clear to my e, and would appear to confirm what Dr. Heitzmann says; but I n willing to be instructed.

Dr. S. E. Davenport.—I feel that this Society is under obligations Drs. Heitzmann and Bödecker for presenting before us this ident step in histology. There is, to my mind, no more interest-g study than that of histology, and dental histology particularly. was my good fortune to have a short course in Dr. Heitzmann's oratory some years ago, and although I was as untrained as any y could be in the use of the microscope, I was perfectly con-rted to the idea that the reticulum not only existed, but that I uld see it plainly in many specimens. But those specimens were own under a very high power, and were consequently not as in, by a great deal, as those which are presented to-night. I

now feel that if those gentlemen throughout the country who have all along objected so strenuously to the idea that there was a reticulum in the dentine could have the privilege of seeing these specimens they would say, "Certainly there is a reticulum," for without doubt the metallic particles from the amalgam filling are deposited in the structure of the dentine at some distance from the periphery of the cavity.

Dr. Allan.—As Professor Heitzmann said some fourteen years ago, this new discovery as to the reticulum was announced by Dr. Bödeker, and certain specimens shown to prove his position. In a paper read by Professor Heitzmann last year before this Society, he presented the subject of the reticulum in protoplasm, and his claims as to its discovery; that is a question on which I never had a controversy with him at all, but which I propose to leave him with his peers, who, by the way, give him very little credit for its discovery. If you will hunt through the books on histology and physics, you will be astonished at the few times Professor Heitzmann's name is mentioned, and the very little credence given to the fact that he discovered the reticulum at all, or had any connection with it. But that is not the question before us. The only dispute I have ever had with him is the one relating to the reticulum in dentine and enamel, which I have always denied, and now, after looking at his specimens, more positively deny than ever. More strenuously than ever I defy Dr. Heitzmann and Dr. Bödecker to accept the invitation extended to them by the Society in a carefully-drawn resolution, worded by our worthy president at that time,—Dr. Howe, who retained *my* explanation, protoplasmic reticulum,—inviting them not to submit the specimens to experts chosen by the Society alone, but to experts chosen by both the Society and Professor Heitzmann. They were invited to co-operate with the Society to prove their position by showing their specimens to those capable of judging what they could see.

If any of you gentlemen have a question in dentistry that is important, you do not go to a committee on microscopy; nor does an astronomer pick out a geologist if he has a question of the sidereal world to solve. Why can we not have the specimens submitted to those who, from their position and acquirements, are able to settle this matter forever? Any decision that the Society will agree to that will simply open the door to a careful examination of these slides will be satisfactory to me. Dr. Miller, of Berlin, has been most anxious to see these slides and these specimens, but he has never been able to do so. He called on Drs. Abbott, Heitz-

mann, and Bödecker, but he never could see any slides or specimens, as he was told that the lenses were either out of order or the gentlemen did not have them at home at that time. Drs. Andrews, Black, and Sudduth deny that this reticulum exists. Though they have tried diligently, they have never been able to see it. Now, whether I am right or wrong is very easily proven. This question has been before the dental public for fourteen years, and outside of New York you will find no one who accepts these views or teaches them. What is the meaning of it? They cannot get slides to show this reticulum. There is no proof of it, therefore they do not teach it. I deny that the reticulum is shown in those specimens.

Dr. Bödecker.—I think this is nothing but a personal matter between Professor Heitzmann and Dr. Allan. When Dr. Miller was visiting me, I gave him forty or forty-six specimens. My lenses have never been out of order when a microscopist called at my house. If any of the gentlemen will come to Dr. Heitzmann's laboratory, I am certain they are at liberty to examine anything they wish. Dr. Heitzmann will go to the laboratory any time and allow them to examine all the specimens.

Dr. Hart.—I think we have been wasting about fifteen or twenty minutes trying to discuss matters that took place before this Society a long time ago. How would Dr. Allan account for the stain exhibited by Dr. Heitzmann taking place within the tooth and a space being crossed by that stain, if it were not for the reticulum described by Dr. Heitzmann? If we discuss the paper, and do not refer to facts which took place long ago, more important conclusions can be arrived at.

Dr. Allan.—I wrote to Dr. Miller immediately after what Dr. Bödecker told me at a late gathering of dentists, and I have Dr. Miller's letter, in which he tells me that he has some six unimportant specimens of Dr. Bödecker's, none of them even claiming to show the reticulum, and that when he called on the latter his oil-immersion objective was missing. As to Dr. Hart's statement, I want to say that this is merely a matter of demonstration,—simply that and nothing more. I do not care for any theory not backed by proof. You can make a theory to meet anything. I deny that there is a reticulum present, and what I assert is that skilled microscopists will say so when they examine the proof preparations. The finer branches of the canaliculi would explain all that Professor Heitzmann alluded to. There is no difficulty in accounting for living matter throughout the entire basis-substance of the dentine. It is not necessary to suppose that there is a reticulum

there. I only want to say one word more. I again challenge Professor Heitzmann and Dr. Bödecker to submit, in any way that this Society may choose, their specimens before such a committee as the Society and they jointly may determine, and let us then have the matter decided for us.

Dr. Walker.—Can I ask Professor Heitzmann and Dr. Allan one question? Can either of them tell me whom they consider dental microscopists in this country? Then I will accept the challenge as offered by Dr. Allan; I am prepared to do it.

Dr. Allan.—I suppose Dr. Black is a dental microscopist, also Dr. Andrews and Dr. Sudduth; but I assure you that it is not necessary for a man to be a dentist to be an expert microscopist and histologist. This is a question of demonstration in histology. On that broad basis I stand. In the Twenty-third Street College, the Johns Hopkins University, or wherever you go, there are trained microscopists enough who will answer this question for us.

Dr. Walker.—Can Professor Heitzmann name any one?

Dr. Heitzmann.—Dr. Walker, modesty forbids it.

Dr. E. H. Stebbins, of Shelburne Falls, Mass., then read the paper of the evening, entitled "Argenti Nitras as a Remedy in the Treatment of Pyorrhœa."

(For Dr. Stebbins's paper, see page 659.)

DISCUSSION.

Dr. Brockway.—Do you mean by treating a few teeth at a time, at one sitting?

Dr. Stebbins.—Yes, at one sitting.

Dr. Allan.—In the use of nitrate of silver for pyorrhœa, is one application of the powder sufficient?

Dr. Stebbins.—Yes, usually.

Dr. Allan.—Does it show as much discoloration on the necks of the teeth as in cavities?

Dr. Stebbins.—The compound that it forms with the organic matter in the cementum causes it to remain there. It is not so dark because you have not so much of the organic matter.

Dr. Allan.—Do you not have necrosis of the soft tissues?

Dr. Stebbins.—Yes; but it will take that all away. It will slough, and the gum, in every case I have seen, becomes hard. You press on it, and there is no pus exuding.

Dr. Allan.—There is no destruction of good tissue?

Dr. Stebbins.—The operation of the nitrate is superficial, so if it

be applied to the gum it will not penetrate deeply,—not so far as to destroy more living tissue than necessary.

Dr. Allan.—Did you say it will remove tartar?

Dr. Stebbins.—No; I said that the tartar will not re-deposit. It will not remove the tartar that is there. In the case I mentioned the tartar would re-deposit, but now it does not do so to any amount.

[Dr. Stebbins produced a boy and girl on whose teeth he had used the nitrate of silver. In the boy, the temporary second molars, the upper and one of the lower teeth, were treated six years ago last March, and have not been treated since.]

I am talking of the deciduous teeth now. The approximal cavities were treated four years ago; the patient would pick them, and the cavities increased in size and have been again treated. I have put in gutta-percha in some to keep them from being interfered with by the patient. You may examine this boy if you wish.

Dr. Bödecker.—About eighteen years ago I experimented a great deal with nitrate of silver in different ways; not in the way of treating caries, but in pyorrhœa alveolaris, abscesses, necrosis, tumors, etc. The method of application varied from that described by the author of the paper. At that time I came upon a method by which you can carry the minutest quantity of a crystal of nitrate of silver into any spot you desire. If you take a very fine wire of platinum and make a little loop on the end, warm that loop in the alcohol lamp, and then dip it into powdered nitrate of silver, and melt whatever sticks to this loop, you can carry the nitrate of silver into any place you please. It will dissolve anywhere where there is moisture. Furthermore, in treating cases with nitrate of silver, I pursued a little different course. In using it under the gum to overcome the difficulty experienced when the nitrate of silver comes in contact with the tongue or gum, you do not need to use the paper, because paper will not prevent it on account of the moisture; the nitrate of silver will creep under the paper. Take a glass of salt water, and let the patient rinse the mouth before using the nitrate of silver; then dry thoroughly with paper the place which you want to cauterize, and apply the nitrate of silver. If anything flows out the salt water will immediately coagulate the nitrate of silver, and form an insoluble chloride of silver. Let the patient rinse the mouth with the solution of salt water after the application of the nitrate and no harm will be done to the surrounding tissues.

Dr. Stebbins.—In this little girl's teeth the second inferior temporary molars were treated six years ago. They have large cavities

now, and when I get through this evening I shall put some kind of soft filling in those cavities, and then she will have no more trouble about the progress of decay.

Dr. Bödecker.—I have been asked to explain my experience with the nitrate of silver in pyorrhœa alveolaris. I would state that my results with it have not been quite as satisfactory as with some other methods I have employed. My present method of treating most of the cases of pyorrhœa alveolaris is that I use the spray apparatus with some antiseptic. With this I have had more success than with anything else; at the same time treating those cases with a solution of iodide of zinc, the prescription of which was given to me some fifteen years ago by Dr. Northrop, and I must thank him again for it now. With Dr. Northrop's permission I will give the prescription to the society. It is a saturated solution of sulphate of zinc, a saturated solution of iodide of potassium, equal parts, which in turn is saturated with the crystals of iodine.

Dr. Hodson.—I would like to ask Dr. Stebbins what method he takes to obviate the possible effects of this material upon a fully or nearly exposed pulp in the first teeth. What happens if it is exposed?

Dr. Stebbins.—That brings to my mind a case that came into the office Saturday. Last July a lady brought her little boy, about three years old, to me. He had been suffering with toothache that kept him awake, and she had heard that I was treating children's teeth, and so brought him in to see if anything could be done. The upper incisors and cuspids were decayed. Some had large cavities, and some not very large. The child had only sixteen teeth erupted. The second temporary molars were not through. The upper molars were decayed badly, and probably exposed pulps caused the pain. I did not ascertain whether the pulps were exposed or not. I treated all those teeth with the nitrate, and he has not had the toothache since. That was about ten months ago. One of the molars has a pulp-tumor. The pulp of the other is dead. When I get home I shall remove that tumor, probably by cauterizing it, and then prepare and fill the pulp-chambers. I have been asked about the application of the salts. You can see by this instrument. It is rather crude, but it will hold the wooden points, and it will reach the posterior side, or any part of the teeth. If I want to go to the side of the tooth in pyorrhœa, I make it very slender, and I have the salts pulverized. I keep them in an open dish, so I can dip the point in. I would just moisten it, touch it on the salts, apply it to the tooth, be sure that it is thoroughly covered, hold it

there a minute, then syringe it out. You do not have to keep the mouth perfectly dry. I have never known a case where the overflow of the dissolved salts caused any trouble. If it were a deep cavity, and I wanted to hold it a little longer, I would place the salts in, cover with a piece of cotton, and let it stay there five minutes; then draw it out and dismiss the patient. In pyorrhœa you will learn how much it takes by trying better than I can tell you. Carry it down as far as the tooth is exposed. In a few days I find the gum hard, where it was formerly soft and fluctuating. In the case of a patient I know, the left central and lateral incisors and cuspid were affected. That patient had lost many teeth with pyorrhœa, and these were very loose and sensitive. I put the salts around them. He came home from the Legislature a week later, and I pressed the gums, but found them perfectly hard.

Dr. Brockway.—Some dentists speak of using a solution of the salts. Is there any advantage in that?

Dr. Stebbins.—I think not; the salts, with the organic matter, form an insoluble compound.

Dr. Hodson.—Then Dr. Stebbins does not care whether the pulps are exposed or not when he makes this application?

Dr. Stebbins.—Dr. Howe said it was a good way to destroy the pulp. It will destroy the pulp in adults. In two cases I destroyed it by a too close application of the agent. I have not tried much to keep exposed pulps of deciduous teeth.

Dr. Hodson.—I knew it would destroy the pulp, but the question arose whether you would use it to relieve pain in a child's tooth.

Dr. Stebbins.—Yes; the cases that came to me last Saturday were those where the children had pain.

Dr. Brockway.—I simply wish to say that I was very much impressed with Dr. Stebbins's article in the INTERNATIONAL DENTAL JOURNAL last October, and I was the more impressed because I have been in the habit of using nitrate of silver myself occasionally for many years. I am quite ashamed to mention this fact, inasmuch as I did not have courage enough, or did not use it understandingly enough, to go on and secure decided results; but I have for the past twenty-five years occasionally touched softened spots, especially on the buccal surfaces of the molar teeth, with nitrate of silver with the hope of retarding decay. I have done it almost empirically, and with good results; but, as I say, I have not had courage enough to carry the treatment out as I should have done, and I was, therefore, especially pleased with Dr. Stebbins's article, because it confirms what little experience I have had and strengthens it.

Since reading the article I have used the nitrate of silver in many cases, and although it is too soon to speak with much positiveness of the results, I have the greatest faith in the treatment. If it will do anything like what is claimed for it, you will agree that it is one of the most valuable contributions to dental knowledge that we have had from any source whatever. I shall proceed to use it in cases of pyorrhœa, because I have great faith in the statements and illustrations which Dr. Stebbins has given.

Dr. Howe.—I suppose there is no doubt but that the use of nitrate of silver is old, and I think there are many who could say, as Dr. Brockway has, that they have used it. But it has remained for Dr. Stebbins to bring out the scientific application of it and demonstrate what it was capable of doing. When I saw Dr. Stebbins last summer in Boston, and saw some of the results that he presented there, I was very much impressed with the importance of his contribution. When I came home, I wrote two or three letters to mothers of children who had brought their babies to my office some months previously, when I had been unable to do anything for them whatever, because of the sensitiveness of extensively decayed teeth and the nervous condition of the little patients. I asked these ladies to bring their children back again, and let me see if I could not do something on a new line; and I did apply silver nitrate to these sensitive decaying molars in October. I have recently seen those children's teeth, and they are as black as they can be in the decayed places, and as comfortable as if they never had been decayed. That is only a record of six months, but it is a confirmation of the plan of treatment, as far as it goes. I have used it for the treatment of bad cases of pyorrhœa, but I can say nothing as to results, because the cases are too recent; but I have the greatest confidence that this contribution of Dr. Stebbins's, especially in giving us another means of arresting decay, is one of the most valuable that we have had in many years.

A vote of thanks was tendered to Dr. Stebbins for his extremely interesting and instructive essay.

Dr. Stebbins.—I thank you very much for your kindly reception of me and my paper, and the kindness shown me. I should feel very much out of place to come here to New York if I were not assured that my field is a large one and of deep interest to every practitioner, and by means of which we may relieve cases in which we were unable to do anything before, and that without pain or expense to the patient. I trust it will do good, and that is what I am here for.

Dr. Howe.—I wish to offer the following resolution for action by the Society:

"*Resolved*, That in view of the variable quality and indefinite properties and composition of our compound filling-materials, this Society desires to record its interest in the improvement of compounds for filling teeth, and would invite the co-operation of pharmacists, chemists, and metallurgists, as well as dental manufacturers, in all reasonable efforts to improve and make uniform such cements and alloys as are available for our purposes. We believe that investigation and enterprise in these directions would be abundantly remunerated, and that progressive improvement and professional sentiment would be stimulated by the publication of the formulas of all compound preparations for our use. We recommend that this subject be referred to a committee of this Society."

Resolution seconded and adopted.

Adjourned.

JOHN I. HART, D.D.S.,
Editor New York Odontological Society.

AMERICAN DENTAL ASSOCIATION.

August 2, 1892.—First Day.—Morning Session.

MEETING called to order at 11 o'clock, with the President, Dr. W. W. Walker, in the chair.

The meeting was opened with prayer by Rev. Mr. Baker, of Niagara Falls.

The roll of membership was then called by the secretary, and a motion made to dispense with the reading of the minutes, which was carried.

REPORTS OF OFFICERS.

Dr. Crouse.—The only report the Executive Committee has to offer is the programme, which has been distributed. It will be seen that we have left the afternoons open for clinics, extra meetings, etc. Other than that, it is not different from any other programme we have had. I will say also that the Executive Committee has been working vigorously all the year to get this audience here; we have sent out two sets of circulars to all the eligible members of every local society in the United States.

Report accepted.

REPORT OF PUBLICATION COMMITTEE.

Dr. Cushing.—The committee had made arrangements last yea with the S. S. White Company to publish the transactions, and the were mailed January 1, 1892, and distributed to such societie libraries, journals, and honorary members as were entitled to them There are now left about seventy copies. I have also to repor the following:

RECEIPTS AND DISBURSEMENTS.

Received from the treasurer	$120.50	
Sale of transactions	3.00	
		$123.5
Expended for expressage, postage, etc.	$15.65	
Postage	8.00	
For printing	4.50	
Engrossing memorial	16.00	
S. S. White Dental Company	70.50	
		114.6
Leaving a balance due to the Association of		$8.8

Referred to the Auditing Committee.

REPORT OF THE TREASURER, BY DR. FULLER.

Balance on hand August 4, 1891	$1193.42	
From dues to date	1025.00	
From money received from the Michigan State Society	25.00	
		$2243.4
Expenditures		1033.3
Leaving a balance of		$1210.0

Of this balance $300 is the unexpended portion of the $500 fo Section VI., and $25 is the money from the Michigan State Society

Report referred to the Auditing Committee.

The President, Dr. Walker, then read his address, of which th following is an abstract:

GENTLEMEN,—While I have but one or two special subjects t which I feel called upon to specifically direct your attention, it i proper, I think, that I should congratulate you upon the progres and high rank American dentistry has attained through the combine efforts of the members of this Association. . . . But while this is true it is also true, judging the future by the past, that there yet remain a wide field for successful experiment and practical application i which and by which science, as the chief handmaid of our pro-

fession, shall yield results equally, if not indeed surpassing, the achievements hitherto attained.

THE WORLD'S COLUMBIAN DENTAL CONGRESS.

We are all aware of the joint action of the Southern and American Dental Associations, which created an Executive Committee of fifteen, clothed with full power to take such action as in its judgment it should deem best to carry out the objects of its organization, such action to be final and binding. . . . We stand pledged to do whatever may be in our power to make the occasion contribute notably to the elevation of the profession, to stimulate the spirit of research, to strengthen fraternal courtesy, and promote cardinal cooperation throughout the world among all who desire the advancement of dental science and art. The aim would be too limited if it included less than this, and the enterprise will be a failure if it falls short of a realization of this ambition.

It is the first time in the history of American dentistry that we have had an opportunity of demonstrating to the whole world what has been accomplished in all departments by American dentists in the last half-century. . . .

All reputable dentists of the United States are cordially invited to participate in this congress, and there is reason to believe that the invitation will be accepted by large numbers of foreign dentists. We expect the presence of distinguished representative dentists from almost every civilized country, and nearly all of note in our own, resulting in the largest gathering of dental practitioners in the history of our profession.

To accomplish this vast work a considerable sum of money will be needed. The General Finance Committee, which consists of Drs. L. D. Shepard, A. L. Northrop, and Truman W. Brophy, after careful estimates, place the amount to be contributed in advance of the congress at thirty thousand dollars; so you may imagine the magnitude of the work to be done by the twenty-three committees under the Executive Committee. . . .

DENTAL EDUCATION, LEGISLATION, AND THE DENTAL DEGREE.

With so many different colleges in the United States, most of them recognized as reputable, and about the same number of State examining boards, or boards of censors, as termed in some States, all working presumably for the welfare, advancement, elevation, and harmony of the dental profession, I feel justified, after a recent personal experience, in bringing these matters before this

Association for consideration, and, if deemed expedient, for some kind of action.

As the law stands to-day, students can enter any of the dental colleges with a certificate from a grammar-school, or after passing a preliminary examination in branches prescribed by the National Association of Dental Faculties, and pursuing a curriculum which will extend over three years, with an annual term of seven to nine months, and then passing the prescribed final examinations. Now, with all these qualifications which have been made necessary, and a degree granted by any of the reputable colleges, it would seem reasonable that a graduate from any such school should be allowed to practise his profession in any State of the Union without being put through the humiliation of another examination.

If the growing tendency towards dissociating the teacher's from the examining and licensing function should become the rule whereby college faculties shall be concerned solely with the educational training of students, and the work of examining and licensing be relegated to properly constituted and trustworthy State boards of examiners, there could be no valid excuse for the lack of inter-State comity in the matter of mutually recognizing State standards of dental education.

We should have more confidence in our fellow-men, and not degrade ourselves with suspicions of any lack of integrity on the part of the personal staff or faculty of a properly conducted and reputable college.

We must remember that the gentlemen composing such faculties are among the most honored members of our profession, and have worked with diligence and zeal to assist in making it what it is to-day. I will grant you that up to within a few years the faculties of our dental schools might in some instances have been a trifle more lenient with students than they should have been, and many were sent out into the world perhaps not quite up to the standard; but with the new dental law which has gone into effect we will have a new order of things, and active legislation tending to harmonization of the standards of the various State examining boards, so that the certificate of each will secure to the holder of it unrestricted license to practise in all the other States, is a question which immediately concerns us at this time, and is respectfully submitted for your action.

There has been too much clashing and slashing going on between schools and different State boards.

Now, gentlemen, this sort of thing should be stopped, and I de-

sire to recommend a plan for the remedy. In an annual address before the Dental Society of the State of New York, delivered in May, 1891, I made the following suggestion: I have learned from reliable authority that several of our prominent colleges are willing that their candidates for graduation shall be examined by their respective State boards at the same time that the Faculty examinations take place, and when the candidate has passed both bodies satisfactorily, that the usual diploma shall be conferred, countersigned by the proper officers of the State examining board. I will say that these gentlemen are of the same opinion to-day.

In all States where dental colleges exist this plan should be adopted. I think all States should be divided into districts, each, possibly, with its corresponding district society, and each district should have a board of examiners, and in the State board each district should be represented by one examiner from the district organization, recommended to the State society by the said district, and all State boards so constituted by this system should be elected by the dentists in the State, and never appointed by the governor of the State.

A national board of examiners is probably not necessary, but if the need should arise such a board could easily be created under the scheme here proposed, and when so created should act only as a final court of appeal, with jurisdiction over questions involving lack of harmony in inter-State relations concerning matters of examinations, licenses, etc., and formulate plans tending to uniformity in matters of ethics, legislation, and education throughout the United States.

COMMITTEE ON STATE AND LOCAL ORGANIZATIONS.

The question of some practical method by which the members of the dental profession throughout the United States can be more definitely secured, and a closer relationship established between the American Dental Association and the various State and local organizations of this country, is one deserving of especial consideration by this body at this time. The best interests of American dentistry demand a more intimate and closely-knit organization of its best working forces, to the end that better work in all departments may be done, and especially is this necessary with reference to the showing we are to make at the coming World's Columbian Dental Congress. . . . It is proposed to emphasize the section work of the American Dental Association by making each section a repository of the results accomplished throughout the Union, in its

given department, and that the annual report of the Association shall truly represent the progress of dentistry during the previous year. As a foundation for the accomplishment of this purpose it is suggested that a series of questions, carefully chosen as to importance and suggestiveness, though few in number, be formulated by this body, and circular-letter copies be sent to every State and local organization in America, with the request that one or more of the queries shall be taken up as a regular order of business for careful consideration and discussion at each stated meeting of such local organization to whom the circular is sent; that a careful and accurate report of the discussion on each topic shall be sent to the secretary of the American Dental Association, who shall transmit the report to the chairman of the proper section, who shall then, from all reports, so secured, collate the date contained therein and make a careful digest of the same, which shall constitute the basis of his report to the American Dental Association, for discussion by the whole body and publication in its annual report of transactions. As a part of this plan, each local organization, furnishing a report of its discussions, shall be requested to send its quota of delegates to represent the said local organization and intelligently discuss the questions at issue, as embodied in the report of his society, when it comes up for action in the American Dental Association. . . .

The plan here proposed is not intended to do away with that already in operation, . . . but it is suggested as an additional plan of work, by which it is hoped to secure several valuable factors, tending to increase the usefulness and strength of our Association. These are, briefly, 1, a more intimate relation and community of interest between the American Dental Association on the one hand, and the State and local organization on the other, and, growing out of this, 2, the co-operative organization of the whole working force of the dental profession in America; 3, the plan proposed will furnish the necessary material as a basis for the active development of the sectional work in this Association and place the sections on a firm basis, so that each will become a sub-organization engaged in special work under the government of the general body, which then will become a truly representative federation of active societies of specialists, and cease to be little more than an expansion of the usual local organization. . . .

For carrying out the purposes of the proposed plan, I would suggest that a standing committee be appointed, which shall be known as the Committee on State and Local Organizations, whose duty it shall be to secure the co-operation of all State and local

organizations throughout the land . . . and have full charge of all matters which may properly fall within the limit of subjects indicated by its title. . . .

NEXT ANNUAL MEETING.

. . . If, as is expected, all reputable dentists in the United States will attend the World's Columbian Dental Congress, it will certainly be inexpedient, if indeed it will be possible, to hold two meetings so near the same time.

In the first place, the sections could not get material, and, secondly, we could not secure a full attendance. I would suggest that the next meeting be simply a business one, and that the only business to be transacted shall be the election of officers for 1894, and action upon the report of the special committee to whom was referred the amendment of the Consitution and By-Laws. . . .

Reference was then made to the death of Dr. John Allen, who died at his home in Plainfield, N. J., March 8, 1892.

Dr. Patterson.—I would suggest that the President's address be referred to a committee, and after the committee reports the discussion can take place.

On motion, the following committee was appointed: Drs. E. C. Kirk, L. D. Shepard, and J. N. Crouse.

Dr. Crouse.—At the end of this programme you will see printed certain rules which govern the speaking. One is in regard to the giving of the name before speaking, and the others about paying the dues. I hope all the members will follow those rules.

Dr. Hunt.—I would like to make an announcement: At the last meeting of the Executive Committee of the World's Columbian Dental Congress, some new appointments were made, and I would be pleased to meet the chairmen of the various sub-committees, to give them the additional names that have been placed on the committees, in order that all may be notified to attend the meetings.

Dr. Crouse.—As is probably known, the Dental Protective Association is taking testimony at the Cataract House during this week. If there are any members here who have testimony which they consider important, I will be very glad to receive it. It will save an immense amount of time and money, because I have to travel all over the country to get it. We have a test case on now, and we want to get all the testimony we can. I also have some by-laws in my pocket which are not signed, and if any one wishes to join the Association I shall be glad to take his name.

On motion, the secretary was authorized to pay all properly authenticated bills.

Dr. Peirce.—The Committee on Voluntary Essays wishes to report that it has received one paper from Dr. Stainton, of Buffalo, entitled "Crownless Teeth."

Adjourned.

AMERICAN ACADEMY OF DENTAL SCIENCE.

THE regular monthly meeting of the American Academy of Dental Science was held at the Boston Medical Library Association Rooms, on Wednesday, April 6, 1892, at 7.30 P.M., President Brackett in the chair.

Papers were read as follows: By W. Xavier Sudduth, M.D., D.D.S.; subject, "Dental Education."

(For Dr. Sudduth's paper, see page 645.)

By Charles H. Taft, D.M.D.; subject, "Silica: Its Curative Action in the Treatment of Alveolar Abscess."

(For Dr. Taft's paper, see page 653.)

DISCUSSION OF DR. SUDDUTH'S PAPER.

President Brackett.—Gentlemen, this paper is before you for discussion. It is plainly the work of an earnest man, who has the courage of his convictions, and he presents strong arguments in support of his ideas. The matter of dental education has excited much interest in this community, owing to what has been considered the somewhat peculiar position of other States.

Dr. Fillebrown.—My own position in this matter, and, I believe, also that of the Faculty and alumni of the Harvard Dental School, coincides with that of Dr. Sudduth. There is, therefore, no room for discussion. I heartily commend the paper, and wish that every State in the Union had a law like Massachusetts, requiring that every dentist who wishes to practise should pass an examination.

Dr. Andrews.—I agree with Professor Fillebrown, that the paper is so sensible in every way that there is very little to discuss. One thing I would like to say, and that is, I believe thoroughly in "every tub standing on its own bottom." We know that the graduates of certain colleges are allowed to practise abroad without examination, while the graduates of others are not. Let a system of universal examination be brought into use, and fairness and justice will be done to all. In some of the States dental colleges are owned by their professors, and are run for the profit they can get out of them.

Much of the opposition to the ruling of State law and State examinations has come from colleges whose Faculties are deeply interested in the profits of the institution. I believe heartily in the sentiment of the essayist.

The board of State examiners should, however, have some respect for what the dental colleges have done. A case occurred in the Boston Dental College where a student was rejected by the Faculty, but passed by the State examining board.

Dr. Grant.—We as dentists ought to exert our influence to settle the proper relations which should exist between the dental colleges and the State examining boards. The dental colleges of a State should go before the Legislature and ask that they might appoint an examining board to determine the qualifications of candidates for graduation in the dental schools, with the power of granting licenses to such graduates and others who may be qualified to practise.

There are many instances where a feeling of general bitterness has been expressed towards a dental school by an unsuccessful candidate for graduation, because he thought his rejection was unjust, being influenced in a certain degree by personal feeling on the part of some member of the board of instruction in the school. If an independent board of examiners passed upon the qualifications of all candidates no such feeling could exist. Where the executive of a State is left to appoint an examining board simply from personal acquaintance or the recommendation of another man, it is no wonder that often the proper persons are not appointed.

Dr. Cooke.—Considering the history of our dental law, it is a wonder to me that we have one at all; it is extremely fortunate, in my opinion, that the whole matter of dental legislation was taken out of our dental societies and put where it is. If, instead of one operation, a candidate were required to do five or six before the State board, there would be a better opportunity to determine his ability.

Dr. Banfield.—It seems to me very inexpedient to examine and pass a man on one simple operation.

Dr. Andrews.—The State board should have the State society back of them for advice and reference. The Massachusetts Dental Society should attend to this.

Dr. Fillebrown.—I am in full sympathy with the board, and believe thoroughly in the institution. If I criticise their actions, it is done merely to urge to higher standards.

DISCUSSION OF DR. TAFT'S PAPER.

Dr. Hitchcock.—If I understood the essayist correctly, he began treatment in February, 1891, and ended in March, 1892. It seems to me that if the abscess was not cured in less time than that, silica had little to do with it. I would like to ask Dr. Taft whether he purchased his peroxide of hydrogen or prepared it himself.

Dr. Taft.—I purchased it.

Dr. Hitchcock.—If I remember correctly, peroxide of hydrogen is dormant at a temperature below 40° F., and at a temperature of over 70° it loses its oxygen. The solution should be made by a competent chemist, and kept in a cool place.

Dr. Williams.—Dr. Taft's mention of the use of silica reminds me of a case I had fifteen or twenty years ago. It was a very obstinate ulceration, occurring after the extraction of a tooth. The patient was not in very good health, and suppuration continued for some time. I tried various remedies without effect. Dr. Cabot, who was an excellent surgeon, gave me a hint. It was to apply silicate of soda, a little diluted, perhaps half or two-thirds strength, on a bit of cotton. That seemed to have a very good result, and I applied it once a day for several days, and I think in the course of ten days the case was healed. I have found it very useful in several cases since.

Dr. Cooke.—I would like to ask Dr. Taft what was the strength of the dose he used in the last case.

Dr. Taft.—The medicine I last gave was in the one-hundred-thousandth potency.

Dr. Cooke.—I do not understand what virtue there can be in a solution made from the hundred-thousandth potency.

Dr. Taft.—I hope the gentleman does not confound a simple dilution with a potency. If you put a couple of drops of a drug in a bucket of water you get a solution with no value as a medicine; but if you take two drops of that drug and add ninety-eight drops of alcohol, and shake it, then you get a potency; then take two drops of that and add to it ninety-eight more of alcohol, and shake again, and so on,—in that way you evolve the medicinal properties of a drug.

Dr. Williams.—This shaking must be done by hand, as I understand it. Wouldn't it have the same effect if the solution were put in a machine and shaken up?

Dr. Taft.—I should think the effect would be the same. I don't know about that.

Dr. Allen.—I have no experience in administering homœopathic remedies in dentistry; but, if you wlll allow me, I would like to speak of two cases of their use which interested me a great deal. Each case happened to be in the family of a homœopathic physician, both physicians being eminent in their profession. One case was a chronic alveolar abscess, which originated in a central incisor that had a Richmond crown on it. The crown had been placed there by a dentist who is well known to most of us, and there is reason to believe that he had thoroughly prepared the root, and had filled it properly. Notwithstanding that, an abscess formed, followed by a fistula and a copious discharge of pus, which condition seemed to indicate the removal of the crown and further treatment of the root. I suggested to the doctor that he try his homœopathic remedies on it,—certainly a safe thing to do, you would say,—and that the dentist should not interfere until it became imperative that he should do so. My suggestion was followed, and the result was eminently satisfactory. I had occasion to examine the lady's mouth afterwards, and the apparent healthy condition of the root fully warranted the course that had been pursued.

The other case was an acute alveolar abscess in the left superior second bicuspid, which also had a crown upon it. The lady's husband was a physician, and an enthusiast in homœopathy. He refused to have the dentist treat the case, saying that he would take care of it himself. As there was very great swelling and much fever present, I did not believe that speedy relief could be obtained without lancing the abscess, nor a cure effected without opening the root. The abscess, however, was not lanced, but homœopathic remedies were administered internally, and relief followed within a very few hours, together with a rapid subsidence of the swelling.

If it is not irrelevant to the subject, I would like to give a personal experience in regard to homœopathic medicines. It was my ill fortune several years ago to injure the instep of my right foot. I was in a lecture-room, and a number of students were seated on a settee directly in front of me. They were leaning back, and finally tipped over, and I received the weight of that row of students on my instep. The injury seemed trifling at the time, but next morning my foot was very lame, and for several days continued to be so, when, happening to mention my accident to a friend who was a homœopathic physician, he said, "Let me prescribe for it,—I will

give you some arnica." Said I, "Yes, I think arnica would be very good to rub my foot with." He replied, "You must take it internally." I laughed, and had no faith whatever in it, but took his dose, and next morning my foot was very comfortable, and continued so for several days, when the trouble again appeared. To make a long story short, the trouble would subside, and then reappear at intervals of a few days, the relief always being coincident with a dose of medicine administered internally. After the absence of six months, during which time the trouble again appeared, I went to him for an examination. He said the periosteum had been bruised, and that a bone abscess was threatening. At my request he prescribed for me, and told me that later on I would know what the remedy was. Relief followed immediately, and has been permanent. In reply to my question afterwards as to what the medicine was, he said it was the one-hundred-thousandth potency of arnica.

Dr. Williams.—I would like to ask the gentleman if in any of these cases silica was used.

Dr. Allen.—I do not know. It would be very easy to find out. I know that silica is used by homœopathic physicians in cases of suppuration.

Dr. Andrews.—I want to say a word in appreciation of this paper. I don't think we have had a better-written one in this association for a great while, and although I am not able to discuss it, I am glad that I have heard it. The action of homœopathic remedies does not seem at all improbable to those who have prepared microscopical tissues, and have noted the effect that minute percentages of reagents have on them.

Dr. Hitchcock.—I do not want to be understood, Mr. President, as criticising the practice of homœopathy, as I have some faith in it. But I was surprised at the length of time required for treatment in the case described by Dr. Taft.

Dr. Taft.—The case was undergoing treatment during that period mentioned, but I was not using silica all that time. I would say that the effect of one dose of silica will go on in the system for as long as eight weeks. I think my mistake in the treatment of the fistula was that I produced what is called an aggravation by repeating the medicine a second time too soon. I felt sure, after I had given the other two remedies without any result, that if the silica were given in a very high power it ought to cause the flow of pus to cease entirely, and the result bore out my conclusions. It shows how beautifully the higher potencies work, and shows, too, that the

very word "potency" means power, and the higher the potency is carried the greater the discretion to be exercised in the use of the drug.

Dr. Eames.—I have always understood that mischief would not be incurred if the remedy was not applicable, or, as is popularly said, "Homœopathic medicines do no harm, even if they do no good."

Dr. Taft.—Well, if the selected medicine is not the *similium*, and does not reach the totality of all the symptoms, it has no effect. For instance, let a person when well take a few drops of the tincture of gelseminum. If he is at all sensitive he will notice in a few minutes that his pulse has from ten to fifteen beats fewer in the minute than it had before, with a feeling of chilliness accompanying it. This will soon be followed by heat, a quickened pulse, with pains in the head, and perhaps in the back and limbs. In short, he will find that he has a fever. Soon a prickling sensation is felt, perspiration breaks out, and in a little while he is well again. Now, it is just because gelseminum produces fever symptoms when given in large doses that it cures the same symptoms when administered in small doses.

Dr. Eames.—Then, if one had no disease at all, it will cause these symptoms in a healthy person? If a child gets hold of a vial-full of a certain drug and takes a quantity of it, it has the effect of producing the disease in the child for which the drug is used?

Dr Taft.—Certainly.

Dr. Eames.—I can hardly see how the shaking of the drug, as given by Dr. Taft, is different from the dilution.

Dr. Taft.—There are a good many things that cannot be explained,—we have got to accept them as facts. We might say, for instance, that because we cannot understand how waves of a certain kind can be sent over an electric wire so that six messages can be sent from either end at the same time, that it cannot be done. We cannot understand how hydrogen and oxygen unite in certain definite, fixed proportions to form a drop of water, but we know that they do. Just how this action is obtained with drugs nobody knows, but it is a law, and a fixed law, as those who have tested it well know.

Dr. Meriam.—Do we understand, then, if we get a remedy that meets all the symptoms, there is no death?

Dr. Taft.—I do not go so far as that,—we are talking of curable cases.

Dr. Briggs.—I would like to ask Dr. Taft if he uses silica in all cases of alveolar abscess, as in the one case that he has cited.

Dr. Taft.—No, sir; by no means. I would not be understood as saying that I use silica in every form of abscess. I very often use mercuries or hepar sulphur, the administration of either one depending entirely upon the condition of the other symptoms. They are equally valuable with silica, providing certain symptoms are present. Silica is a very slow, deep-acting drug, and, as I have said, is suited rather to chronic than to acute cases.

Dr. Briggs.—It is inert, is it not, on healthy human organism?

Dr. Taft.—Not in its medicinal form. In its crude form it is practically inert.

Dr. Briggs.—What are the symptoms that occur in the healthy individual in its medicinal form?

Dr. Taft.—It affects the whole system, from the top of the head to the tip of the toe.

Dr. Briggs.—Does it produce suppuration?

Dr. Taft.—Yes, in its physiological action.

Dr. Briggs.—Does Dr. Taft know how many times that has been proven?

Dr. Taft.—I do not; but all of the symptoms that are ascribed to it are not the provings that have been obtained by its administration to any one individual, but those that have been gathered from a number of individuals.

Dr. Williams.—I would like to ask if it is known who is the discoverer of this remarkable effect obtained by shaking by hand.

Dr. Smith.—I would like to ask Dr. Taft, if he gives this silica for chronic abscesses, as he cites in his paper, why it would not be equally serviceable for an acute form of abscess to allay the inflammation before suppuration takes place?

Dr. Taft.—Mercuries or hepar sulphur have the power to hasten suppuration or prevent it entirely; that is to say, if the process of suppuration has begun and cannot be averted, it will be materially hastened by the administration of either.

The case in question, Mr. President, was entirely without other symptoms. The lady was one of the healthiest individuals that I have ever seen. There was not a single symptom to aid in the selection of the remedy other than what was presented in the fistula itself. The fact that I had no success in treating it by dental agents or methods, and the fact that the discharge was so profuse all the time as to be exceedingly annoying, made it very pleasant for me to have her say of her own accord that she noticed an improvement the very next day after the administration of the medicine. It shows how nicely the medicine worked. We cannot explain how

it worked, but if the lady were here she would tell you there was no question but that it did.

Dr. Meriam.—There is one thing to be considered in connection with this case. From Dr. Taft's description I should judge that the fistula was entirely sheltered from pressure, and such are extremely difficult to heal.

Dr. Smith.—Dr. Taft has said that were his patient here she would tell us that he had not overstated the case. Any one who is acquainted with Dr. Taft asks no further evidence for the truth of his assertion than his plain, unsupported statement.

The paper, I think, has been an exceedingly interesting one. He has seen fit to venture into new fields and try these drugs, and he has made, under the circumstances, a creditable success of it; and, what is more, he has the courage of his convictions, and the heroism to come here and present them.

In my dental-student days we never were taught to use remedies to abort abscesses, and I doubt very much to-day if a majority of our practitioners in dentistry are in the habit of resorting to drugs of any kind to assist in treatment. I have had under my dental care some eminent physicians and surgeons, and have purposely asked them what drug they would recommend for use in the treatment of abscessed teeth, and those eminent men say, "None." The homœopathists claim that drugs have their proper effect and will cure, and I have had cases of this kind where the patients were homœopathic physicians, and while I performed the surgical part of it, they took what they considered the proper drug, and I have always got along with these in a thoroughly satisfactory manner.

We have had cases where it is claimed that Christian science cures. I have two patients who were under treatment with the best allopathic physicians for years, men who were eminent in their profession here in Boston, and after trying everything in their science, they gave them up as incurable. Those patients went to Christian science, and in two or three months' time they were well people. Naturally, these are firm believers in the Christian-science cure, and one of them who was particularly nervous is now a much better patient; in fact, she is an excellent patient. She states that she succeeds when in the chair in absenting herself from her body. And so, gentlemen, I pay my tribute of respect to the essayist, and I am inclined to try the treatment which he has outlined.

Mr. Houghton.—I have been under the care of homœopathic

physicians for the last two years. Before that time my health had been very poor, and I was under allopathic treatment for a number of years. I first came under the doctor's care when I was about twelve years old, and it was about that time that I began to have my teeth filled with amalgam and gold fillings. I kept growing worse until about three years ago, when I first came under the treatment of a homœopathic physician. At that time I think I was taking about a dozen different kinds of drugs, but soon began to improve under homœopathic medicines. My physician felt that I was not improving as fast as I ought, and ordered my amalgam all removed, and since then there has been a rapid change for the better.

Dr. Williams.—The gentleman, in relating his own experience, spoke of having two kinds of fillings in his mouth,—amalgam and gold. His physician recommended the amalgam fillings to be removed, after which he noticed a marked improvement. I want to ask if any effect was attributed to the remaining gold fillings by the physician?

Mr. Houghton.—Not that I know of.

Dr. Taft.—In closing I would say, Mr. President, that I had no intention, in presenting my paper to-night, to antagonize in any way the two great schools of medicine. It was simply to give you the benefit of the experience that I have had in administering an important and valuable drug, and incidentally I have spoken of other homœopathic remedies.

I brought with me to-night a small volume on homœopathy called "Hering's Domestic Physician," which has one or two chapters devoted entirely to the affections of the teeth. Usually there is no question about the symptoms of any case, because the patient can express those symptoms quite clearly. When a case presents itself I recognize at once certain "key-note" symptoms, which suggest a given drug. I then turn at once to the chapter alluded to, and look up the symptoms coming under it. If a large number of those symptoms do not come under that drug, I look up another, and go through as quickly as I can the different drugs to see which one has the largest number of symptoms corresponding to those of the patient, and when I find what I think is the right one, I take the large *materia medica* and confirm my opinions; then, with considerable confidence, give the medicine in the very high power I have spoken of.

I have also brought with me this medicine-case. It holds enough of the more important remedies which the dentist would need for

affections of the mouth and kindred troubles. It contains only a small proportion to the number of remedies that are used in the science of homœopathy.

I have just started to make a record of every case in which systemic treatment is adopted. In this record I put down the name of the patient, all of the symptoms present, the aggravation and ameliorations, and the medicine that I give, taking pains to find out from the patient afterwards what the action of the medicine has been. In a large proportion of cases relief is given at once, and in almost all within a day or two. In some I do not select the right remedy, and consequently have to give the case further study. In this way I hope in time to get a homœopathic dental *materia medica* that will be as accurate as my own practical experience can make it. I find systemic treatment just as useful in the management of an exposed pulp, which begins immediately to ache after a careful capping, as in cases where there has been continuous pain. I had such a one come to me about a month ago. A young lady suffered a great deal after a capping that I made in an inferior bicuspid. Notwithstanding the fact that I capped it very carefully, the tooth gave her considerable trouble, and for two weeks I tried capsicum plasters and all the local obtunders of pain with which we are familiar. At first they had good effect, but the pain would soon recur. I did not want to destroy the pulp of the tooth, so I took very carefully all the symptoms, and from what I could gather thought that belladonna was the indicated remedy. I gave her the medicine, but it had no effect whatever. I told her that before destroying the pulp I would like to have one more trial, and after making a further careful study of the case, prescribed mercurius, when the pain ceased almost immediately, and she has had no serious trouble with it since.

Dr. Briggs.—The key-note of the use of the drug is its high potency?

Dr. Taft.—Yes.

Dr. Briggs.—And don't prominent homœopaths practise only in the lower potencies?

Dr. Taft.—Yes, there are a great many of those. Their number is much greater than that of those who use the high potencies.

WILLIAM H. POTTER, D.M.D.,
Editor American Academy of Dental Science.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

The Ninth Annual Meeting of the National Association o Dental Faculties was held at the Cataract House, Niagara Falls commencing Monday, August 1, 1892.

Twenty-six colleges were represented, as follows:

Baltimore College of Dental Surgery.—R. B. Winder.

Boston Dental College.—J. A. Follett.

Chicago College of Dental Surgery.—Truman W. Brophy.

Harvard University, Dental Department.—Thomas Fillebrown.

Kansas City Dental College.—J. D. Patterson.

Missouri Dental College, Dental Department of Washington University.—W. H. Eames.

New York College of Dentistry.—Frank Abbott.

Ohio College of Dental Surgery.—H. A. Smith.

Pennsylvania College of Dental Surgery.—C. N. Peirce.

Philadelphia Dental College.—J. E. Garretson.

University of Iowa, Dental Department.—A. O. Hunt.

University of Michigan, Dental Department.—J. Taft.

University of Pennsylvania, Dental Department.—James Truman.

Vanderbilt University, Dental Department.—W. H. Morgan.

Northwestern College of Dental Surgery.—B. J. Roberts.

Louisville College of Dentistry.—Francis Peabody.

Indiana Dental College.—J. E. Cravens.

Northwestern University Dental School.—E. D. Swain.

Dental Department of Southern Medical College.—William Crenshaw.

Dental Department of University of Tennessee.—J. P. Gray.

School of Dentistry of Meharry Medical Department of Central Tennessee College.—G. W. Hubbard.

University of Maryland, Dental Department.—John C. Uhler.

Columbian University, Dental Department.—H. C. Thompson.

Royal College of Dental Surgeons of Ontario.—J. Branston Willmott.

American College of Dental Surgery.—John S. Marshall.

University of Denver, Dental Department.—George J. Hartung.

The *ad interim* committee reported that it had investigated a charge preferred against the University of Maryland, Dental Department, by the College of Dentistry of the University of California, of graduating a person in less time than the rules demanded; that it found that no rule of the Association had been violated, and

had so reported to the parties in interest; that it had dismissed an effort for the reinstatement of the American College of Dental Surgery, Chicago, as not within the jurisdiction of the committee, with the advice to reorganize the College before attempting to influence the Association to change its action, which reorganization has since been accomplished.

The committee also stated that its value in settling such matters had been made so clearly apparent that it recommended that it should be made a standing committee, to be elected by the Association, instead of being appointed by the president.

The report was received and placed on file, and the recommendation with regard to the status of the committee was adopted.

The following resolutions, laid over from last year, were adopted:

Resolved, That in case of charges against any college no final action shall be taken until all parties concerned shall have at least thirty days' notice.

Resolved, That at all future meetings of the National Association of Dental Faculties the delegates shall consist of members of Faculties, and demonstrators will not be received.

The following resolutions, also over from last year, were laid on the table:

Resolved, That after June, 1893, the yearly course of study shall be not less than seven months, two months of which may be attendance upon clinical instruction in the infirmary of the school, now known as intermediate or infirmary courses.

Resolved, That after the session of 1892–93, four years in the study of dentistry be required before graduation.

The following resolutions lie over under the rules:

Offered by Dr. Winder,—

Resolved, That hereafter graduates of pharmacy be placed on the same footing as graduates of medicine, and be entitled to enter the second-year or junior class, subject to the examination requirements of each college.

Offered by the Executive Committee,—

Any college failing to have a representative present for two successive sessions without satisfactory explanation shall be dropped from the roll of membership of this Association.

The Chair, having been asked for a ruling upon the admission of graduates of pharmacy to the junior class, decided that under the

rules they could only be admitted to the first-year or freshman class.

The Executive Committee offered a report recommending the restoration of the American College of Dental Surgery to full membership, which, after an explanation by Dr. Marshall of the reorganization of the College, was unanimously adopted.

The Executive Committee reported on the application of the Western Dental College, of Kansas City, recommending that it lie over for another year. The report was adopted.

The report of the Executive Committee recommending the rejection of the application of the Tennessee Medical College, Dental Department, of Knoxville, Tennessee, for irregularities in conferring the degree of D.D.S. and in the reception of students, was adopted.

The application of Howard University, Dental Department, Washington, D. C., was laid over for another year.

The following applications for membership, also reported by the Executive Committee, lie over under the rules:

United States Dental College, Chicago.

Homœopathic Hospital College, Dental Department, Cleveland.

Detroit College of Medicine, Department of Dental Surgery.

The report of the Executive Committee recommending that the Baltimore College of Dental Surgery be censured by the Association for conferring the degree of Doctor of Dental Surgery upon Charles F. Forsham, M.A., LL.D., of Bradford, England, *in absentia* and honorarily, in violation of the rules of the Association, was adopted.

Dr. Truman offered an amendment to the rule regarding the conferring of the degree of Doctor of Dental Surgery honorarily, absolutely prohibiting the exercise of that privilege to the members of the Association, but the amendment was lost, after discussion, it being the general sense that the present rule is a sufficient safeguard against the unworthy bestowal of the honor.

Dr. Cravens offered the following amendment to the constitution, which goes over under the rules:

Amend Article VII. so that it shall read as follows:

ART. VII. Any reputable dental college, located in any State of the United States, may be represented in this body upon submitting to the Executive Committee satisfactory credentials, signing the constitution, conforming to the rules and regulations of this body, and paying such assessments as may be made.

The Association adopted a protest against the classification of

lentists as manufacturers, as provided in House Bill No. 7696, known as the Wilcox Bill, and against the collection of statistics from dentists under its provisions, on the ground that dentists are not manufacturers in any sense, not being engaged in the manufacture, fabrication, or sale of any product having a merchandisable value; that all the laws heretofore passed in the various States and Territories and the District of Columbia distinctly recognize dentists as professional men; and that the attempt to collect statistics would be an injustice not only to them but to their patients, and that such statistics if collected would be valueless to the government, because showing the product of a class of men not engaged in manufactures.

The following, offered by Dr. Winder, was also adopted:

Resolved, That the National Association of Dental Faculties recommend that their alumni write and demand of the Census Bureau of the United States the return of all statistical reports, as, under the recent agreement between the dental profession and said bureau, lawyers, physicians, and dentists are exempted from making statistical reports for the census of 1890; and that a copy of this resolution be forwarded to the chief of the Census Bureau.

A communication from the Post-Graduate Dental Association of the United States, suggesting the establishment by the colleges of short courses of training and teaching especially designed and arranged for practitioners, was received and referred to the Executive committee.

The manuscript of a Compend of Materia Medica and Pharmacy for Dental Students, by Dr. E. L. Clifford, of Chicago, was referred to the committee on text-books, with power to act.

Dr. Marshall offered the following resolution, which was adopted:

Resolved, That the secretary be instructed to notify the National Association of Dental Examiners that the National Association of Dental Faculties considers it out of its province to legislate upon the relative values of the D.S. and D.D.S. degrees.

The following were elected officers for the ensuing year: President, J. D. Patterson, Kansas City; Vice-President, H. A. Smith, Cincinnati; Secretary, J. E. Cravens, Indianapolis; Treasurer, H. . Smith, Cincinnati.

Executive Committee.—F. Abbott, New York; J. Taft, Cincinnati; . O. Hunt, Iowa City.

Ad Interim Committee.—James Truman, Philadelphia; Franl Abbott, New York; Thomas Fillebrown, Boston.

The president appointed as the *Committee on Schools.*—Drs. J A. Follett, Boston; S. H. Guilford, Philadelphia; E. D. Swain Chicago; C. N. Peirce, Philadelphia; T. W. Brophy, Chicago.

Adjourned to meet at the call of the Executive Committee.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

The Eleventh Annual Meeting of the National Association o Dental Examiners was held at Niagara Falls, commencing Monday August 1, 1892.

The sessions were presided over by the vice-president, Dr Magill,—the elected president, Dr. L. D. Shepard, of Boston, ex plaining his resignation from the State Board of Massachusetts which necessarily carried with it his resignation of the presidency of the Association. The resignation was accepted with regret and Dr. Shepard was unanimously accorded the privileges of the floor.

The following State boards were represented at the sessions:

Colorado.—George J. Hartung.
Georgia.—D. D. Atkinson.
Iowa.—J. T. Abbott, J. B. Monfort.
Indiana.—S. T. Kirk.
Maryland.—T. S. Waters.
Minnesota.—L. W. Lyon.
Massachusetts.—E. V. McLeod.
New Jersey.—Fred. A. Levy.
Ohio.—Grant Mollyneaux, Grant Mitchell.
Pennsylvania.—W. E. Magill, Louis Jack, J. A. Libbey.
Tennessee.—J. Y. Crawford.
Wisconsin.—Edgar Palmer.
Kansas.—A. H. Thompson.

The following boards were admitted to membership:

Virginia.—J. Hall Moore.
North Carolina.—V. E. Turner.
Oklahoma.—D. A. Peoples.
South Dakota.—C. W. Sturtevant.
District of Columbia.—Williams Donnally.

At the instance of the Committee on Colleges, the following communication was sent to the National Association of Dental Faculties:

"NIAGARA FALLS, August 1, 1892.

"TO THE NATIONAL ASSOCIATION OF DENTAL FACULTIES:

"GENTLEMEN,—Whereas, a very considerable abuse has arisen by the improper use by students of the various certificates of the schools, such as the 'standing' and 'passing' certificates, to support students and graduates under age in their attempt to illegally engage in practice; we therefore ask your Association to request the various colleges to have their 'standing' and 'passing' certificates of such uniformity of terms in each case that they can be used for no other purpose, and that they be printed in few words and small type, and be signed only by the dean.

"Respectfully,

"NATIONAL ASSOCIATION OF DENTAL EXAMINERS,

"FRED. A. LEVY,

"*Secretary.*"

A committee of conference was appointed, consisting of Drs. Truman, Marshall, and Swain, on the part of the Faculties' Association, and Donnally, Palmer, and Monfort, on the part of the Examiners' Association, which, after consultation, agreed upon a favorable report.

Dr. Lyon offered the resignation of the Minnesota board, which was laid upon the table, as it had evidently been offered as the result of a misunderstanding, and the board was requested to withdraw it.

The following resolution, offered by Dr. Crawford, was adopted:

Resolved, That when a member of any State board becomes a teacher of dental school, his resignation from this board shall follow.

A resolution protesting against the classification of dentists as manufacturers and the collection of census statistics from them, under the provisions of House Bill No. 7696, commonly known as the Wilcox Bill, was adopted. The resolution was similar in terms to those adopted by other dental societies.

The Committee on Colleges reported that they had received reports showing that the actual number of students in attendance at the last sessions in the schools recognized by the Examiners' Association was 2881; of graduates, 1357. In the schools not recognized by the Association the students were 236; graduates, 96.

The report also considered desirable advances to be made in educational methods, and offered the following memorial, which the secretary was directed to transmit to the National Association of Dental Faculties:

"The National Association of Dental Examiners would respectfully memorialize the National Association of Dental Faculties to authorize two advances in the system of dental education.

"These are: First, that your Association require the universal enforcement of a higher grade of preliminary education of candidates for matriculation. This proposition lies at the foundation of dental education, in which is involved the quality of the graduates of the future, upon which depend the advancement, the standing, and the dignity of the dental profession.

"The second proposition is that complete preparation be made in each school for laboratory technique in the studies of histology, pathology, and in each of the departments of dental surgery and dental prosthesis, and that this method of teaching be made a requirement of the schools."

The committee also reported the following amended list of colleges which they recommend as reputable:

Baltimore College of Dental Surgery, Baltimore, Md.

Boston Dental College, Boston, Mass.

Chicago College of Dental Surgery, Chicago, Ill.

College of Dentistry, Department of Medicine, University of Minnesota, Minneapolis, Minn.

Dental Department, Columbian University, Washington, D. C.

Dental Department, National University, Washington, D. C.

Northwestern University Dental School; formerly Dental Department of Northwestern University (University Dental College).

Dental Department of Southern Medical College, Atlanta, Ga.

Dental Department of University of Tennessee, Nashville, Tenn.

Harvard University, Dental Department, Cambridge, Mass.

Indiana Dental College, Indianapolis, Ind.

Kansas City Dental College, Kansas City, Mo.

Louisville College of Dentistry, Louisville, Ky.

Missouri Dental College, St. Louis, Mo.

New York College of Dentistry, New York City.

Northwestern College of Dental Surgery, Chicago, Ill.

Ohio College of Dental Surgery, Cincinnati, O.

Pennsylvania College of Dental Surgery, Philadelphia, Pa.

Philadelphia Dental College, Philadelphia, Pa.

School of Dentistry of Meharry Medical Department of Central Tennessee College, Nashville, Tenn.

University of California, Dental Department, San Francisco, Cal.
University of Iowa, Dental Department, Iowa City, Ia.
University of Maryland, Dental Department, Baltimore, Md.
University of Michigan, Dental Department, Ann Arbor, Mich.
University of Pennsylvania, Dental Department, Philadelphia, a.
Vanderbilt University, Dental Department, Nashville, Tenn.
Western Dental College, Kansas City, Mo.
Minnesota Hospital College, Dental Department, Minneapolis, inn. (defunct).
St. Paul Medical College, Dental Department, St. Paul, Minn. efunct).
American College of Dental Surgery, Chicago, Ill.
The report was adopted.
The following officers were elected for the ensuing year: Presi- nt, W. E. Magill, Erie, Pa.; Vice-President, J. Y. Crawford, shville, Tenn.; Secretary and Treasurer, Frederick A. Levy, ange, N. J.
Adjourned.

Editorial.

THE ANNUAL MEETINGS AT NIAGARA.

The American Dental Association has had its annual convoca- n, and its work for this year has passed into history. We fear t re can be but one verdict in regard to it,—that, with few excep- ti s, the papers presented were not equal to the standard such a b y should demand. As a natural result, the discussions were e ally unsatisfactory. The fault does not lie with the sections, a hey did all that men could do to make this meeting a notable o , and that it was practically a failure from a scientific stand- p t is chargeable upon the spirit of indifference in the profession at rge.

The contrast between this meeting and that held at Saratoga Sp ngs last year was marked, and it seemed unfortunate that it w so, in view of the fact that it appeared to have a discouraging ef t upon some, and may deter them from any active participation

in the more important gathering next year at Chicago. That th approaching Columbian Dental Congress absorbed the interest wa clearly apparent, and led the members to regard this meeting a merely preliminary to that in Chicago next year. It is to be hope that if this be so, the neglect of this means genuine scientific wor for that international gathering.

The numbers present were fully equal to anticipation, and th social interchanges of men gathered from all parts of the countr compensated in a large degree for deficiencies in other direc tions.

Niagara Falls as a place of meeting has superior advantages not the least this year was the exceptional coolness, very grateft after the extreme heat of the previous week.

The Association declined to consider at this meeting th important changes suggested by the Committee on Constitutior these being laid over for next year. It is very questionabl whether this was a wise decision. It seems more than probabi that there will be less time and inclination to give attention t the various subjects then than would have been given them at thi meeting.

The Association decided to meet next year at Chicago and con fine the work entirely to routine business. It would have beer perhaps, better to have adjourned over until 1894, as it is no probable that a sufficient number of members will be willing t sacrifice the time necessary to the completion of several importan matters.

The National Association of Dental Faculties was fully attended and proved an unusually harmonious meeting. It is gratifying t note that the friction between this organization and that of th National Association of Dental Examiners, so marked last year, wa not perceptible this. There seems to have been a growing effort i both organizations to harmonize differences. If this spirit be con tinued, there is reason to hope that some of the very objectionabl laws now on the statute-books of several of the States may b modified in the near future.

The vote of censure passed on one of the most prominent denta colleges for granting an honorary degree indicated the sentiment o the organization very clearly on that important matter. This wa further enforced in the application of a college for admission wher three degrees of similar character had been conferred. The spiri manifested was so positive that it may be safely assumed that thi degree will not be permitted in the future.

The State boards were fully represented in the National Association of Dental Examiners. The disposition to refer all disputed questions to committees of conference was a move in the right direction, and led very satisfactorily to the harmonizing of differences between the two governing bodies.

The prevailing feeling seemed to be paramount at Niagara that the meeting to be held at Chicago must mark an epoch in American dentistry, and if the interest manifested be a basis for judgment, there need be no anxiety as to the result. To make this a marked success means a year of thorough scientific work for all who propose to take part in its deliberations.

THE WORLD'S COLUMBIAN DENTAL CONGRESS.

The anticipation that this Congress would be fully organized at Niagara Falls was not fulfilled, as the election of the superior officers was postponed until October.

It was with some regret that a disposition was noticed to urge certain men for the highest position. There should be but one rule for the government of the appointing power, and that should be peculiar fitness. We have avoided this subject in the past, as it was felt that the committee having it in charge was competent to meet all difficulties. It was clearly apparent, however, at Niagara that the spirit of politics was working a baleful influence in this as it has in the past in other organizations, and unless positively met might result in serious injury.

It seems to us that but three considerations should claim the attention of the appointing power. The person suggested for the highest place should be one who has been in constant touch with the development of dentistry in America for the past half-century. He should be well versed in parliamentary usage, and be familiar with men in general and the locality of the meeting in particular. If these qualifications be accepted, the circle of choice will necessarily be a narrow one. It would seem to be very inappropriate to place a comparatively young man at the head of a meeting organized to represent to the dentists of the world the progress made during the present century. The past is best represented by age; progress by youth.

The committees having the work of the Congress have accomplished their arduous labor very satisfactorily, and we entertain no misgivings as to the final result.

WOMEN'S DENTAL ASSOCIATION.

An announcement on another page that the women dentis have perfected an organization marks an era in dentistry. It not many years—less than a quarter of a century—since the fir woman graduated from a dental college, and now they have i creased sufficiently to form an organization of their own.

That this is the proper course no one, probably, will question. has been a disappointment to some of the warmest friends of wome in dentistry, that the scientific side of the profession has been s little aided by her advent into it. This has been, possibly, due t the natural retiring disposition of the sex when brought into assoc ations composed of men, but more, doubtless, to the difficulty o securing a professional foothold in a new field. Be the cause wha it may, the work of woman has not been noticeable.

We believe that this organization is a move in the right direc tion, and will prove an active stimulant to greater exertion in work for which we regard woman as being especially qualified, tha of scientific research.

The women dentists have now an opportunity to disarm criti cism and justify the efforts of those who aided them in their earlie struggles.

AMERICAN COLLEGE OF DENTAL SURGERY, CHICAGO

It is a pleasure to be able to announce that this College has been reinstated in the National Association of Dental Faculties.

Since its suspension, a year ago, it has been thoroughly re-organized, with a Faculty composed of men able to give it a high standing in Chicago. The action taken with this school was a valuable object-lesson, in that it demonstrated that no college could openly violate a rule established for the good of the entire body without suffering the penalty. The suspension or expulsion of a college from this organization means its ruin as an educational institution.

Bibliography.

ANNUAL OF THE UNIVERSAL MEDICAL SCIENCES. Edited by Charles E. Sajous, M.D., and seventy associate editors, assisted by over two hundred corresponding editors, etc. Philadelphia, New York, Chicago, and London: F. A. Davis Company, 1892.

With a promptness that does credit to the editor, editorial staff, and publisher, this Annual, in five volumes, is given to the medical reading world. The value of these for reference has ceased to be a question. They have become so important that the wonder grows steadily each year why this compilation of facts was not begun years ago.

The editor truly says in his preface, "It does more than any publication extant for the perpetuation of the journals and of the work presented in them. It carries their names and the good work they contain to all parts of the earth, and, between covers calculated to ornament a library, preserves their identity and their choice contributions for future generations. How many complete series of that once great journal, *London Times and Gazette*, could now be found in the libraries of medical men? Had the Annual then lived most of its talented contributors, now dead to contemporary medicine, would still live through their work; whereas now the difficulty of obtaining access to their writings relegates them to the domains of obscurity."

It is strange, in view of these facts, that a persistent opposition exists to this publication on the part of several medical periodicals.

It is beyond the power of any single individual to read the medical journals now published in all languages, and, therefore, no greater service can be rendered than the condensation of facts from all sources, as presented in these volumes. The work is so well done by the large staff that the yearly advent is looked forward to as furnishing the most valuable series of reference-books published during the year.

Considerable space is given to "Oral and Facial Surgery," by Rudolph Mates, M.D. Full reports of cases, with illustrations, are presented, taken from the dental and medical journals, and furnish a chapter of great value to those interested in this specialty.

While the editor states "no improvements are announced this year," it seems to us that the publication has reached a point of

stability where few changes are needed, and we, therefore, hope may be continued practically as it is,—one of the most useful con tributions to medical literature, and indispensable to every wel selected medical library.

Domestic Correspondence.

DR. BARRETT'S STATEMENT.

[We regarded the controversy in connection with the new department of dentistry of the University of Buffalo as having been closed in our last number, but those in opposition to the methods employed claim to be heard. In view of this not unreasonable request, we admit the following communication.—Ed.]

The "statement" of Dr. Barrett in the International Dental Journal for August properly demands a reply. The question involved is a new one; at least it has not been presented in its present aspect before. There can be no difference of opinion on this point.

Another equally clear and undisputed statement would be, that if this action of the University of Buffalo, in starting its dental department, is proper and free from objections, then any university in the United States can originate a dental department any time it considers it for its interest so to do, and will have no difficulty in finding men who will accept at once honorary degrees and positions in the new school. In that case the dental profession would really have no control over educational institutions. We are suffering now from a "craze" to start dental schools.

Dr. Ottofy's report, as chairman of the Section on Dental Education, etc., at the recent meeting of the American Dental Association, shows that the total number of graduates of some twelve of our schools was less than one hundred. Surely the need of more schools is not apparent.

We have arrived at a time in our history when we can scrutinize not only the character and standing of our schools, but also their origin and antecedents. The University of Buffalo is undoubtedly an institution of character and standing. There is no disposition to belittle it in any quarter. Surely, however, it has no "divine

rights." Any action on its part is of human origin, and subject to fair discussion and frank criticism.

The action had by the University is contrary to the present trend of thought in the dental world. This ought to have been known to some of those interested in the new school. How such action could have been had in ignorance, in view of what has been said and done, is very difficult to comprehend. That the first impression every intelligent dentist had of it was unfavorable cannot be denied.

So far as I am aware, the by no means easy task of defending and explaining this action has fallen upon Dr. Barrett; at least he is the only champion of the University that has prominently presented.

Dr. Barrett is a fluent speaker and writer; in well-rounded periods he excels. But, like many free writers, he oftentimes makes sad havoc with his logic.

The force and weight of what any man says or writes depends not alone on the language used, but upon general accessory facts and considerations. For instance, if a statement made by an individual is in direct contradiction to previous views promulgated by the same writer on the same subject, the strength and force of the statement is very materially diminished; and this is the difficulty with the communication of Dr. Barrett in the August issue. He here earnestly endeavors to justify the conferring of honorary degrees.

This is contradictory to his views on the same subject as expressed in the last January number of the *Dental Practitioner and Advertiser*, in proof of which the following extract is given:

"*Professor Taft speaks approvingly of the recognition of eminent attainments by the conferring of honorary degrees. Therein is found the essence of the whole matter. What authority have schools to recognize merit any more than any other body? A diploma should be a certificate of study, and it is a fraud when it represents anything else. The Delavan diplomas were what Professor Taft approves,—'marks of recognition of eminent services.' The whole system of conferring diplomas as marks of honor is wrong. True, it exists, and has long existed; but so have measles and bum-bailiffs. This pronouncing upon who is and who is not entitled to honor is as foreign to the province of the schools as was the Pope's bull against the comet foreign to religion. A college diploma is a certificate of study,—or it ought to be,—and the man who has not pursued the curriculum of study of the school is no more entitled to it than he is to the tail of the monkey.*"

The statement made that these degrees were conferred for th purpose of expressing the good-will of the University toward dentistry, and to signalize the formation of its new department, i not sustained by the facts.

That the degrees were conferred as a *qualification* was admitte to me by one of the recipients before the event, and by the other subsequently.

That the "University conferred these honorary degrees in per fect good faith and without the slightest thought of doing anythin that would subject itself to criticism," can hardly be true, for botl recipients of this degree and several of the main movers in th matter in the University were notified in writing, some weeks be fore the action was had, that if such were adopted the attention o the National Association of Dental Faculties would be called to it and that the recognition of the school would thusbe prevented.

Dr. Barrett speaks of the New York State degree as being th *highest* qualification that any man can hold in that State. It January he speaks of it as "our bastard State degree,—one tha has neither legitimate educational father or mother, and whicl does not pretend to be an evidence of having pursued any cours of study whatever."

C. W. Stainton.

37 Court Street, Buffalo, N. Y.

THE WOMEN'S DENTAL ASSOCIATION OF THE UNITED STATES.

To the Editor:

Sir,—It is with great pleasure that we announce the organi- zation of the Women's Dental Association of the United States. Not many years have passed (twenty-three) since the first woman graduated at an American dental college. To-day the profession recognizes, among its ablest practitioners, women graduates in dentistry. So general, indeed, has the practice of this profession by women become, in the leading cities of this country, that the formation of this Association may be regarded as but a natural sequence.

Among the leading dentists of this and other cities included in the new organization are Drs. Edith L. Brown, Elizabeth A. Davis, Annie T. Focht, B. M. Jarrett, Maria Lasser, Anna K. Letenmeier, Hannah M. Miller, Martha B. Moore, Mary H. Stil-

well, Margaret Taylor, W. W. Wyeth, and Eliza Yerkes, of Philadelphia; Drs. A. Ireland and Olga Neymann, of New York; Dr. F. E. Hoopes, of Baltimore; Dr. Edith Jewell, of Washington, D. C.; Dr. A. F. Reynolds, of Boston; and Dr. E. L. Benham, of Chicago.

A constitution and by-laws have been adopted, and a charter is about to be applied for. The object of the Association is the advancement of the professional standard, the mutual study of important cases, and especially the support and encouragement which must necessarily result from membership of such a body.

The President is Dr. Mary H. Stilwell; Vice-President, Dr. Anna K. Letenmeier; Recording Secretary, Dr. Eliza Yerkes; Corresponding Secretary, Dr. A. T. Focht; Treasurer, Dr. Maria Lasser; Executive Committee, Drs. Elizabeth A. Davis, Bertha M. Jarrett, and Hannah M. Miller.

Active members are elected from among graduates of dental colleges who are of good standing and in active practice. Names of proposed new members are submitted to the Recording Secretary, whose address is 1404 Chestnut Street, Philadelphia, and who reports them to the Executive Committee. Upon approval by this committee they are submitted to a vote of the Association, and a two-thirds vote secures election. There is an initiation fee of one dollar. The annual dues are also one dollar.

In addition to the active members, the constitution provides for the election, as associate members, of those who have rendered eminent service to the profession.

It is difficult to speak in terms of too high praise of this important movement. While it is customary for men to organize for all purposes in which union gives strength, and while dental associations of men are numerous, women dentists have heretofore stood alone, or, if connected with existing dental societies, have figured mainly as exceptions to the average. The character of those connected with the Women's Dental Association gives assurance that it cannot but elevate the standard of the profession and strengthen the position of its members, as dentists, in the community. Its code of ethics, rightly interpreted, will add dignity to their calling and tend to the establishment of mutually beneficial relations.

It is more than probable that in a short time the influence of this Association will be felt for good, not only in Philadelphia, where it originated, but to a greater or less extent throughout all the United States.

A. B.

Current News.

NEW JERSEY EXAMINATIONS.

THE next meeting of the New Jersey State Board of Examiners will be held at the Commission Rooms, No. 88 Broad Street, Elizabeth, New Jersey, commencing on Tuesday, October 18, 1892. Candidates will please file their applications with the Secretary before October 4. Blanks and information furnished on application.

G. CARLETON BROWN,
Secretary.

88 BROAD STREET, ELIZABETH, N. J., August 22, 1892.

INDIANA STATE DENTAL ASSOCIATION.

THE Indiana State Dental Association, at its last annual meeting, elected the following officers: President, R. W. Van Valzah. Terre Haute; Vice-President, W. M. Hindman, Vincennes; Secretary, G. E. Hunt, Indianapolis; Treasurer, R. T. Oliver, Indianapolis. The Association will meet in Indianapolis on the last Tuesday in June, 1893.

G. E. HUNT,
Secretary.

CONNECTICUT VALLEY DENTAL SOCIETY.

AT the Twenty-seventh Annual Meeting of the Connecticut Valley Dental Society, held at Holyoke, Mass., June 10, 11, and 12, the following officers were elected for the ensuing year: President, Dr. George F. Harwood, of Worcester, Mass.; Vice-Presidents, Dr. F. W. Williams, of Greenfield, Mass., Dr. W. H. Rider, of Danbury, Conn.; Secretary, Dr. George A. Maxfield, of Holyoke, Mass.; Assistant Secretary, Dr. A. J. Cutting, of Southington, Conn.; Treasurer, Dr. W. F. Andrews, of Springfield, Mass.

GEORGE A. MAXFIELD, D.D.S.,
Secretary.

ANNUAL MEETING OF THE ALUMNI ASSOCIATION OF THE NEW YORK COLLEGE OF DENTISTRY.

At the annual meeting of the Alumni Association of the New York College of Dentistry, the following gentlemen were elected to office for 1892:

President, J. Howard Reed; First Vice-President, M. C. Gottschaldt; Second Vice-President, Alfred R. Starr; Secretary, Vincent M. Munier; Treasurer, Zachary T. Sailer.

Executive Committee.—Sherman B. Price, H. J. Parker, and E. S. Robinson.

VINCENT M. MUNIER,
Secretary.

Selections.

DENTISTS IN THE ARMY AND NAVY.

[We are indebted to the *Southern Dental Journal* for republishing a paper on this subject by F. Y. Clark, M.D., D.D.S., of Savannah, Georgia, and read at the Southern Dental Association, April, 1870. As this matter has recently been under discussion, the abstracts we make will be read, we think, with interest, especially the historical portion. The position of a community without a dentist is vividly portrayed.—ED.]

JEFFERSON DAVIS, when Secretary of War to the United States made an effort to employ dentists in the army and navy, and no doubt would have succeeded had he remained in office. From this time, until after the commencement of the war, we know of no further effort being made. Shut in as we were from the North and the rest of the world, we knew little of what was going on without. When the steamer "Water Witch" was captured and the prisoners brought to Savannah, we learned there was a dentist among the number, and that he had quite a supply of material. From this we were led to believe that our profession was recognized by the government, and that dentists were appointed in the army and navy. Shortly after, however, when General Sherman and his hundred

thousand men entered Savannah, we were by practical demonstration better informed. From daylight until dark our dental offices were besieged. The cry was relief from present suffering, "Do something for my teeth that will keep them from aching." We remember one fellow coming to us a few days after having one or two nerves destroyed in his teeth, who wished, as he said, "to buy a good smart quantity of that white, creamy stuff;" for, said he, "when the boys get on the march, and have the toothache, I can get their last dollar with it."

But this was not the only applicant for dental material. Dental instruments were in great demand, and a dental depot would have done a smashing business in Savannah for a few days at that time. Now, would there have been such a demand had there not been a necessity? The innumerable quantity of broken teeth and fractured jaws, produced by bungling instruments and unfamiliar hands, along with stories of rheumatic and neuralgic suffering, caused by exposed pulps and diseased teeth, which we were obliged to listen to during the sojourn of the army in Savannah, were disheartening; and we determined then, should an opportunity ever occur, to contribute our mite towards a remedy.

We cannot but think our general medical director was remiss in his duty in this respect, but not as much so as the members of our own profession, whose duty it was to properly bring the matter before him. At the North almost every State had its society. The American Association and American Convention were in full operation, besides three or four dental colleges, and as many dental journals; yet, with all this array of strength and talent, we hear of little or no effort being made for the end in view. We believe, had the subject been properly brought to the notice of the general medical director, and, with his aid before Congress, by some one of our societies, that dental appointments would have been made in the army and navy, and that the good developed by such appointments would, before now, have produced full recognition on the part of our government as a necessity, and that to-day American dentistry would be occupying a much more elevated position in the eyes of the world than it does.

With us in the South it was very different. We had no dental society or journal, and, owing to the irregularity of the mails and stringency of conscription, we could not act collectively, but had to do what we could individually. As the war went on, and the call for men was renewed and the conscription increased to fifty, we were thinned to almost a corporal's guard. Many towns of several

thousand inhabitants had no dentist. This state of affairs wrought a change little thought of. Officers and government employees, including their families, found the inconvenience and suffering too great to be endured, and their appeals became so numerous and urgent that the surgeon-general was obliged to recommend the detailing of dentists for many towns and hospitals. The hospital practice was productive of so much good that the appointment of a dentist to each regiment was strongly urged as a means of increasing the active duty-list of the army. The following is an extract from a memorial which was presented about that time:

"Our own experience with soldiers, in and around Richmond during the last year, in connection with the statements of some of the most intelligent physicians and officers in the service, fully convinces us that out of every one hundred men sent to the hospital, or those on the sick-list,—exclusive of those wounded in battle,—five, at least, can be traced, directly or indirectly, to some derangement of the teeth that might have been remedied in a few minutes or hours. Thus we have, of one hundred thousand men, five thousand unnecessarily off duty. Now, this five thousand in every hundred thousand might be returned to active duty, or prevented from leaving it, by the appointment of a few dentists, say one to every army division."

This, no doubt, would have had its effect, and appointments would have been made, but the end came, and the project was lost with "the lost cause."

Now, is it not humiliating to our nation and profession to be obliged to acknowledge that the English, with their better teeth and worse dentistry, have exercised more humanity in this matter than we have? Just think of one hundred thousand men, as in the case of the army of General Sherman between Atlanta and Savannah, exposed for months to all kinds of weather, and imagine the amount of suffering they must have endured owing to the want of a few dentists! The army of Washington cannot be argued against this, for then our teeth were much better, and no more what they are now than was the practice of dentistry. Again, it cannot be argued that as the war is over the necessity is past, for every now and then we hear of war-vessels leaving for some distant port, with from three to five hundred men, who are away for months and years without ever seeing a dentist.

We all know how and wherein the army and navy could be benefited by the appointment of dentists, but it is no easy matter to convince the appointing power. No doubt, could we make them

look on the broken teeth and fractured jaws, and force them to listen to the stories of suffering above mentioned, and, better still, experience a little of the pain there alluded to, away from the means of relief, it would not be long before this vacuum in our army and navy would be filled. But as we cannot do this, we must do what is next best,—we must keep on telling them until they will believe us. No military school, no army post or station, no naval ship, or foreign port where ships are stationed, should be without a dentist. Our sailors and soldiers are no more able to pay for dental operations than they are for medical attention; therefore, if we value their services, we should, as a humane and enlightened nation, value their lives. In many distant and foreign ports our sailors and representatives are no better off than at sea. Take the ports of Japan, for instance, where the native surgeons extract teeth by giving them a thorough malleting on both sides until they are loose enough to be removed. The field for good to our nation and profession in such ports is extensive. The advanced state of dentistry would necessarily (as has been the case in Paris with Evans and others) bring us in contact with the officials and higher classes of the country; and we would thus reach influential ears that are now closed to us. But the most direct and greatest good would be to our sailors and representatives stationed there, for they would thus be within reach of innumerable advantages which the advanced state of dentistry offers. To oblige the army and navy surgeons to fill this vacuum is wrong, it is inhuman; for with their medical education only they are little better prepared to perform any dental operation than the patients they attempt to relieve. No medical college has made any attempt to educate their students in this specialty for the last twenty years; they have given it over to the dental schools, where it properly belongs.

THE

International Dental Journal.

Vol. XIII. October, 1892. No. 10.

Original Communications.[1]

A CONTRIBUTION TO THE MINUTE ANATOMY OF THE CEMENTUM.[2]

BY C. HEITZMANN, M.D., AND F. A. ROY, M.D., D.D.S.

HISTORY.

C. F. W. Bödecker, in his essay, "The Distribution of Living Matter in Human Dentine, Cement, and Enamel" (*Dental Cosmos*, 1878–79), says of the cementum, "Delicate parallel striations are to be seen in the cementum, identical with the lamellæ of an Haversian system, and, as a rule, more plainly marked near the periphery than towards the dentine. Within the basis-substance of the cementum there are numerous branching spaces, in correspondence with the lacunæ of bone. The offshoots of these spaces, like the spaces themselves, are very marked in dry specimens, because of their being filled with air. In chromic-acid specimens, on the contrary, the offshoots are much less pronounced; and the less the more thoroughly the decalcification has been effected by the acid. No essential difference is noticeable between the lacunæ and canaliculi of ordinary bone and those of the cementum;

[1] The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

[2] Read before the New York Odontological Society at their meeting on June 1, 1892.

in both tissues there exists a great variety as to the general arrangement, the size of the lacunæ, and the number and ramifications of their offshoots. The walls of the lacunæ and the coarser offshoots, if viewed with a highly-magnifying lens, appear interrupted at their peripheries by light spaces, which lead into a light, delicate net-work, piercing the whole basis-substance to such an extent that only the meshes have to be considered as the fields of calcified glue-yielding basis-substance. Each lacuna contains a protoplasmic body, with a central nucleus,—the cement-corpuscle. The net-structure of the protoplasm is plainly visible in all cement-corpuscles. From their periphery conical offshoots arise, the coarser of which penetrate into the larger offshoots of the lacunæ, while the finest offshoots traverse the light rim between the wall of the lacuna and the periphery of the protoplasmic body, being directed towards the light interruption on the boundary of the lacuna. Numerous cement-corpuscles send broad and branching offshoots through the basis-substance in a vertical or oblique direction to the lamellæ, and not infrequently a direct union is established between two or three cement-corpuscles by means of such large offshoots. In some teeth broad, spindle-shaped spaces pierce the cementum in a radiated direction, all of which contain protoplasm with delicate offshoots directed towards the net-work in the basis-substance. All protoplasmic bodies within the cementum, though greatly varying in shape, agree in being connected with each other by the delicate net-work which pierces the basis-substance. The connection between dentine and cementum is established either by a gradual change of one tissue into the other, without a distinct line of demarcation, or there exists a boundary formed by a more or less marked wavy line, presenting irregular bay-like excavations. Lastly, it occurs that between the bay-like excavations and the dentine there is interposed a stratum of the structure of cementum, with a gradual change of the tissue of the former into that of the latter. Where a boundary with bay-like excavations is present between dentine and cementum, spindle-shaped enlargements of the dentinal canaliculi may be seen. The majority of the dentinal canaliculi, however, reach the boundary of the cementum after repeated bifurcations, by which both the calibres of the canaliculi and their central fibres are gradually diminished in size. A connection of the dentinal fibres with the coarser offshoots of the cement-corpuscles is often observed. The light net-work of the basis-substance of the dentine always passes into that of the cementum."

Of the structure of the cementum at the neck of the tooth this author says, "In the great majority of teeth neither the canaliculi nor their contents, the dentinal fibres, reach that part of the cementum which surrounds the neck, in accordance with the statement first made by John Tomes. Near the periphery of the dentine, bifurcations of the canaliculi, and consequently also of their tenants, the dentinal fibres, take place, some of the finest terminations of which run to the boundary between the dentine and cementum. As a rule, the finest terminations of these fibres are lost to sight in a net-work somewhat coarser than that of the basis-substance of ordinary dentine. Sometimes the dentinal canaliculi, when approaching the periphery, become slightly dilated, so as to produce slender, pear-shaped cavities, in accordance with which the terminating dentinal fibres exhibit slight enlargements. The cementum around the neck forms a narrow layer, cut off obliquely at the place of junction with the enamel. It is built up by delicate prisms or spindles, arranged vertically to the surface of the dentine. The prisms represent the fields of the basis-substance, and are separated from each other by light rims, holding beaded fibres, or traversed by delicate vertical threads. The cementum on the neck of the tooth is devoid of lamellæ and lacunæ, which appear deeper below, together with all the characteristic features of a fully developed structure of the cementum. The lamellæ become the more distinct, and the lacunæ with their contents—the cement-corpuscles—the more numerous, the broader the diameter of the layer of the cementum."

In the conclusion of his essay, Bödecker makes the following statements: "The cementum, as well as ordinary bone, is provided with lacunæ and canaliculi. The lacunæ contain nucleated protoplasmic bodies, and the canaliculi hold offshoots of the living matter of protoplasm. The whole basis-substance of the cementum is traversed by a delicate net-work, which, in all probability, contains living matter, though this is traceable only in its thorn-like projections from the periphery of the protoplasmic bodies and their larger offshoots. The living matter of the cementum is uninterruptedly connected with that of the pericementum, and continuous with the living matter of the dentine, either through intervening protoplasmic bodies in the interzonal layer, or directly with the dentinal fibres. The cementum covering the neck of the tooth is devoid of lamellæ and protoplasmic bodies. It is built up by directly ossified osteoblasts of the pericementum presenting their prismatic shapes, and everywhere traversed by a net-work of living

matter. This is in connection with the pericementum and with the dentine mainly through the intervening net-work in the basis-substance of the latter."

The first author who confirmed and accepted Bödecker's views as to the minute structure of the cementum was Frank Abbott. In his paper, "Microscopical Studies upon the Absorption of the Roots of Temporary Teeth" (*Independent Practitioner*, 1884), he claims that the bay-like excavations observed in the cementum and the dentine are due to a dissolution first of the lime-salts, and afterwards of the basis-substance, which causes the reappearance of protoplasm in certain pre-formed territories. The new infiltration of these territories with basis-substance often results, even in the dentine, in a formation of bone-tissue.

Bödecker's claim that all the three hard tissues of the teeth—the dentine, the cementum, and the enamel—are alive in a living organism, although largely based upon assumptions, was fully verified by later observers. Frank Abbott, in 1880[1] and in 1885,[2] directly proved the presence of a delicate reticulum in the enamel, after complete decalcification by means of chromic and acetic acids. John I. Hart, in 1891,[3] has conclusively shown the presence of a delicate reticulum interconnecting the dentinal fibres and pervading the whole basis-substance, by means of a protracted stain with solution of chloride of gold, and subsequent decalcification with acetic acid. The proof of the existence of such a reticulum in the cementum was, however, lacking. In some specimens prepared in C. Heitzmann's laboratory by Dr. William Carr, in 1889, this structure was plainly seen, and last winter we decided to work up this topic more thoroughly than had been done in previous years.

II. METHOD.

A recommendable method for the study of the microscopical structure of the cementum is to grind a tooth as thin as possible, always keeping it moist with a one-per-cent. solution of table-salt. First a coarse slab is made of the freshly-extracted tooth with a fine saw or with a corundum stone in the lathe, which afterwards is ground thin on a corundum slab, and finished on an Arkansas stone. The specimen is not allowed to become dry for a moment. After brushing away the débris from grinding, the specimen is

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[1] "The Minute Anatomy of Dentine and Enamel" (*Dental Cosmos*, 1880).

[2] "The Minute Structure of Enamel" (*Dental Cosmos*, 1885).

[3] "Minute Structure of Dentine" (*Dental Cosmos*, 1891).

directly mounted in chemically-pure glycerin, or staining with ammoniacal carmine may be resorted to, though such a stain is of comparatively little value for the study of cementum. Some of our illustrations are made from specimens prepared in the just described manner. They are especially plain when examined immediately after mounting, but rarely fit for higher powers of the microscope, exceeding five hundred to six hundred diameters. After several weeks, when the glycerin has thoroughly saturated the specimen, the minute features are, as a rule, less conspicuous than on the freshly-mounted specimen.

The method first employed by William Carr, in 1889, for bringing to view the minutest structure of the dentine, is a protracted stain with one-half of one-per-cent. solution of chloride of gold of plates ground thin with the finger on grinding-stones and corundum slabs, with subsequent complete decalcification by means of a six-per-cent. solution of glacial acetic acid. This method has also enabled John I. Hart to obtain perfect specimens of dentine. The same procedure we have adopted for clearing up the minutest features in the structure of the cementum. Freshly-extracted teeth are placed in a one-per-cent. solution of table-salt and ground thin, as before stated. It is important to leave the extracted teeth but a short time in the salt-solution,—a few hours at the utmost,—since the protoplasmic formations of the cementum become hydropic and unstainable with chloride of gold if left in the solution for days. This tissue, being directly exposed to the salt-solution, is affected by it sooner than the dentine. Special care must be taken in keeping the slabs moist with a weak solution of table-salt, lest the specimen become dry, and the lacunæ and the coarser canaliculi filled with air, by which the details are rendered indistinct or are completely lost. After the slab—immaterial whether a longitudinal or a transverse section—has attained a sufficient degree of thinness, as proven by mounting on a slide and covering with the thinnest possible covering glass, it must be washed carefully and repeatedly with a camel's-hair brush, under continuous renewal of the salt-solution. Next the slab is placed in a one-half of one-per-cent. solution of chloride of gold, whereby all metallic instruments must be avoided, the simplest spatula being a match shaped with a penknife. If several sections should be ready for treatment with chloride of gold, it is necessary to note that each one be in free contact with the gold-solution. Specimens overlapping one another prevent a perfect stain, because they will not allow the desired contact and penetration with the gold-solution.

The time required for exposure to the gold-salt is somewhat different with different teeth, probably due to the variable amount of lime-salts infiltrating the cementum. The best results we have obtained were on temporary teeth left in the gold-solution from six to seven hours,—certainly a shorter time than is required for staining the dentine. The following exposure for ten hours to a six-per-cent. solution of glacial acetic acid is, as a rule, sufficient for complete decalcification of the cementum, and now the specimen may be exposed to broad daylight for a number of days, until it has assumed a dark-violet or dark-purple color. The only precaution required at this stage of the procedure is to renew the distilled water in which the specimen lies every day, in order to prevent the growth of mildew. A drop of chemically-pure glycerin added to the distilled water is a sure means of keeping away the mildew. The mounting of such specimens is invariably done in glycerin,—the only medium which allows the examination with the highest powers of the microscope.

We admit that the results obtained in the described manner were not uniformly satisfactory, in contradistinction to dentine, in which failures are exceptional. We cannot account for the fact that specimens of different teeth, of which we knew that they were alive and perfectly fresh, yielded good images only in a fractional number. Cohnheim, the discoverer of the gold-stain, met with the same accidents. Sometimes the basis-substance assumes a deeper color than the contents of the lacunæ; the latter may remain even so pale as to imitate features of devitalized teeth. Specimens, however, well stained, exhibited all features so handsomely that we thought best to describe this method, leaving the invention of new procedures to other observers. It is especially the acetic acid which we suspect of yielding unsatisfactory results, and other acids—perhaps diluted sulphuric acid—will have to be resorted to in future trials. Owing to the unequal efficiency of the method employed, we will abstain from statements which are of the utmost importance to the practitioner,—viz., the definition of the living from the non-living part of the cementum in pulpless teeth. The results of our examination seem to be sufficiently interesting, however, as far as they go, to deserve presentation.

III. CEMENT OF THE ROOTS.

The reason why histologists made so little progress in the recognition of the minute anatomy of bone-tissue generally, was that dry bone was used for study exclusively.

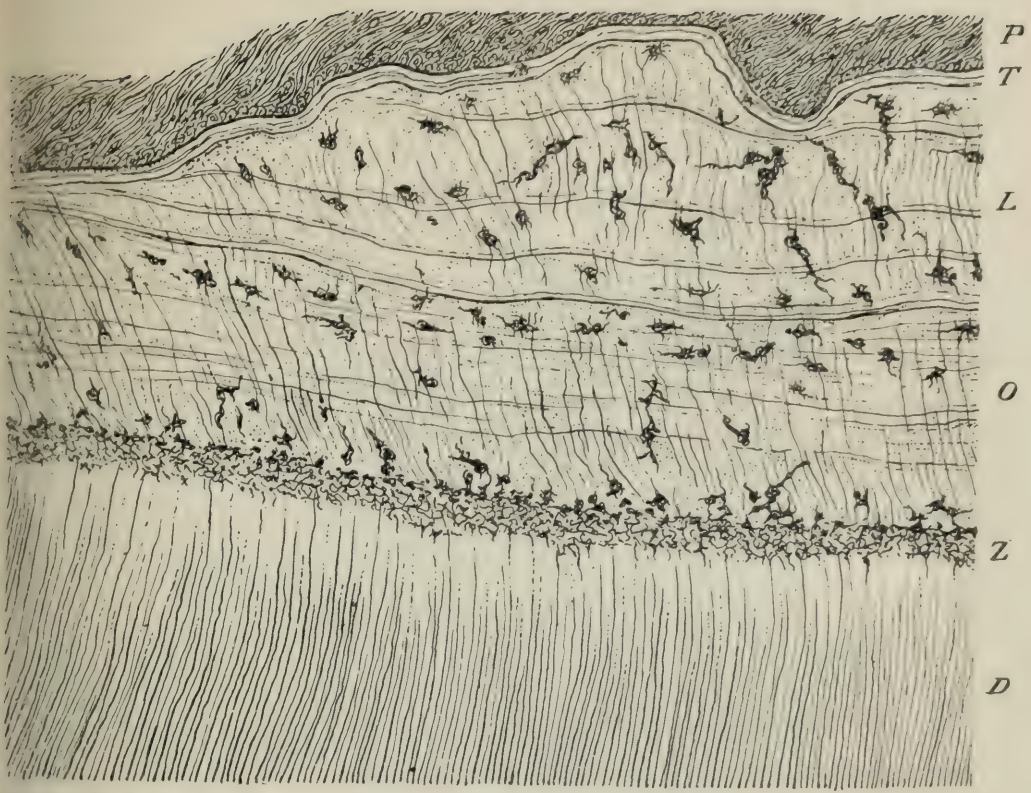
Strange as it may sound, the majority of histologists of all nations still resort to this irrational method, even in our day. As soon as the bone is allowed to dry, all soft parts of the tissue, the seat of life, must perish by shrinkage, and only the frame-work of the basis-substance will be left. This latter is known to be glue-yielding and thoroughly infiltrated with lime-salts. In a dry specimen only spaces, the so-called lacunæ and their offshoots, the so-called canaliculi, could be seen, and the contents of these spaces were thought by some to be a liquid, by others carbonic-acid gas. Charles S. Tomes, in his "Manual of Dental Anatomy, 1876," frankly admits that nothing positive is known as to the contents of the lacunæ. It was twenty-two years ago,—in 1870,—that in Stricker's laboratory fresh, living bone, the thinnest plates of the ethmoid bone of rabbits, were examined microscopically, being kept alive in blood-serum, or in a one-half of a one-per-cent. solution of table-salt. The fact was thus settled that each lacuna holds a nucleated protoplasmic body, the bone-corpuscle proper, from which numerous offshoots arise, penetrating the coarser canaliculi. Not all the canaliculi could be seen to hold protoplasmic offshoots, and even at present the opinion of the best French histologist, L. Ranvier, is that only a limited number of canaliculi contain protoplasmic processus of the bone corpuscles. Obviously a dry bone-specimen, mounted in Canada balsam, showed the lacunæ and the canaliculi filled with air or dirt, and appeared under the microscope exactly like dead or necrotic bone. Still, who will doubt that bone-tissue is alive in a living organism all through, reacts by inflammation upon injuries, grows and is nourished, while a piece of necrotic bone is a foreign body to the organism, and nature makes hard efforts to have it cast off by suppuration of the surrounding tissues.

C. F. W. Bödecker was the first to point out the difference between a living and a necrotic lower jaw-bone under the microscope. In his paper "Necrosis," published in 1878 in the *Dental Cosmos*, he, after softening the bone-tissue with a solution of chromic acid, demonstrated the presence of a protoplasmic body in every lacuna in living bone-tissue; whereas the canaliculi showed prolongations of the protoplasm only in the immediate vicinity of the latter. Dead, necrotic bone, on the contrary, treated in the same manner for decalcification, invariably contained nothing but empty lacunæ, with some scanty, granular remnants of the protoplasm or clusters of micrococci. In both instances the basis-substance appeared to be pervaded by an extremely delicate light filigree, in connection with the lacunæ and the canaliculi.

Since the cementum covering the roots of the teeth is in all its essential features bone-tissue, being lamellated and supplied with a number of radiating lacunæ, the examination of a dry specimen ground thin furnished features identical with those of dry bone. The lacunæ appeared black from being filled with air or dirt, the same as the coarser canaliculi yielding the image of a spider or a crab. If live cementum, immediately after the extraction of a live tooth, be placed into a solution of chromic acid, thin sections could be made with the razor, which, as Bödecker first described, plainly demonstrated the presence of a nucleated protoplasmic body in every lacuna, and offshoots emanating therefrom, which fill the coarser canaliculi; nay, connect with the dentinal fibres at the interzonal layer between cementum and dentine. It was a mere inference that even the finest canaliculi—nay, the most delicate reticulum in the basis-substance—contained fibrillæ of living matter.

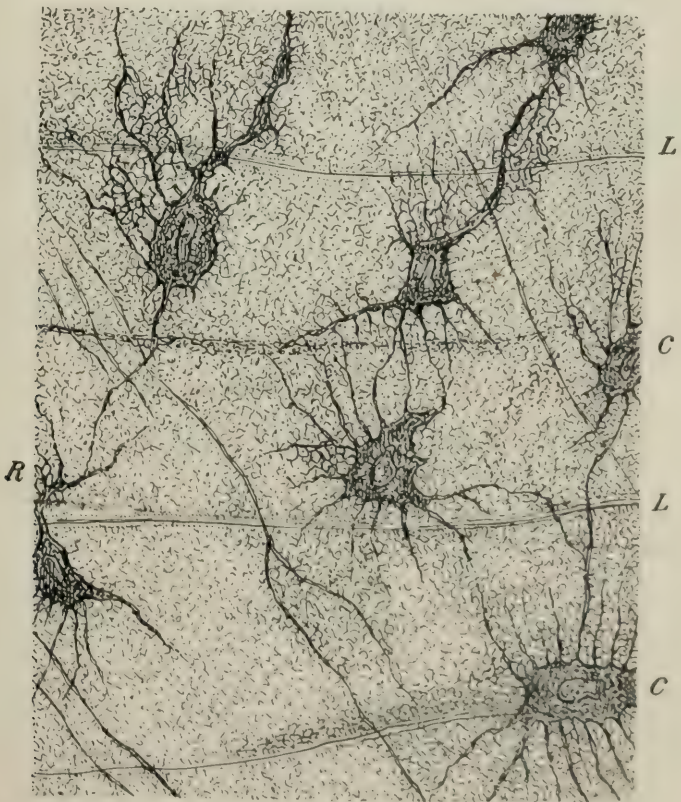
We have examined quite a number of roots of teeth, both deciduous and permanent, in specimens ground thin under the protection of an indifferent liquid, a one-per-cent. solution of table-salt. Our intention has been to study the features of the cement-tissue in freshly-ground specimens, before they were exposed to the influence of a solution of chloride of gold. What we saw in many instances has not as yet been described. (See Fig. 1.)

We find, with low powers of the microscope, the surface of the cementum provided with shallow pits, rendering the border line, in a longitudinal section, hilly or wavy. This corresponds to the rough, slightly pitted aspect of the surface of the roots, if viewed with the naked eye. The lamellated portion of the cement gradually tapers towards the neck of the tooth, and becomes the broader, the more it approaches the apices of the roots. In this portion of the cement-tissue, the parallel lamellæ are conspicuous, and we notice a number of cement-corpuscles scattered in the basis-substance, which differ from ordinary bone-corpuscles only by being more irregular, often elongated, apparently arranged without regularity, certainly without parallelism to the lamellæ. Aside from the cement-corpuscles, we notice a number of lines running from the surface to the dentine, and piercing the lamellæ at right or acute angles, often in union with the cement-corpuscles. The course taken by these lines, which somewhat approach in their parallelism the aspect of dentinal fibres, is always devious to the latter, with which they produce obtuse angles. We have failed to find an immediate union of dentinal fibres with the fibres piercing



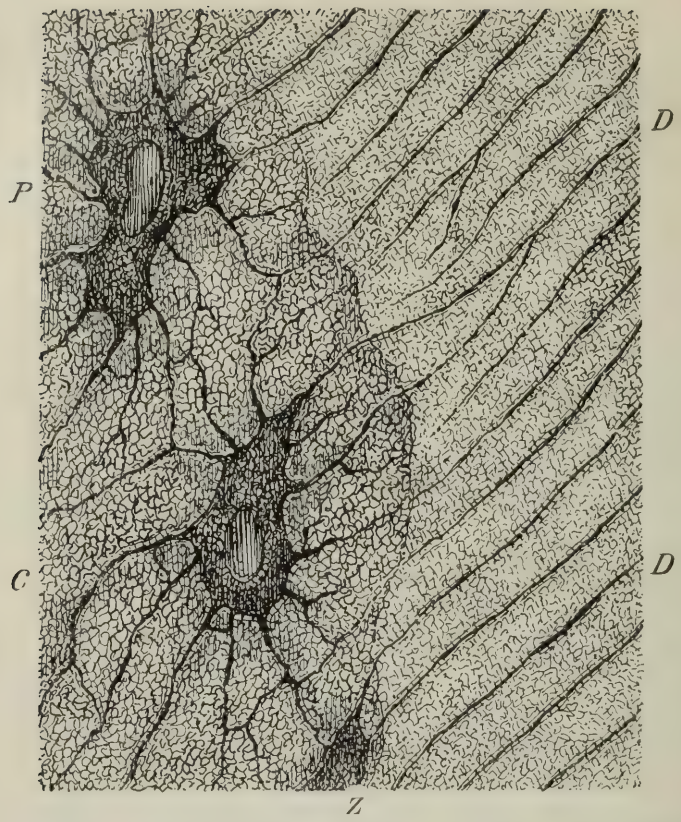
ROOT OF A GROUND BICUSPID, SHOWING A COMBINATION OF LAMELLATED AND OSTEOID CEMENTUM. MAGNIFIED 200.—P, pericementum; T, thickness of the specimen; L, lamellated cementum; O, osteoid cementum; Z, interzonal layer between cementum and dentine; D, dentine.

FIG. 2.



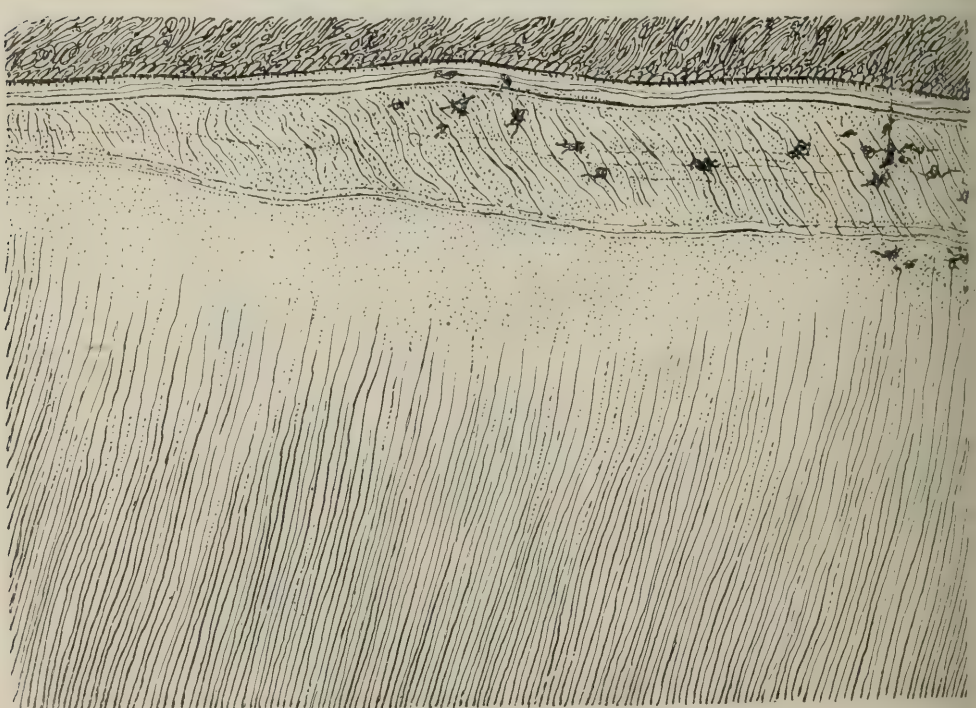
LAMELLATED CEMENTUM OF THE ROOT OF A GROUND BICUSPID. MAGNIFIED 600.—CC, cement-corpuscles branching and interconnecting; R, incomplete reticulum, produced by the finest offshoots of the cement-corpuscles; LL, boundary-lines of the lamellæ.

FIG. 3



ROOT OF A MOLAR IN LONGITUDINAL SECTION. STAINED WITH CHLORIDE OF GOLD. MAGNIFIED 1200.—P, nucleated protoplasmic body with coarse, dark-violet offshoots; C, basis-substance of cementum, pierced by a violet delicate reticulum; DD, dentine; Z, boundary-zone between dentine and cementum; most of the dentinal fibres unite with offshoots of cement-corpuscles.

FIG. 4.



ROOT OF A GROUND BICUSPID IN LONGITUDINAL SECTION. TRANSITION OF THE CEMENTUM OF THE NECK INTO THAT OF THE ROOT. MAGNIFIED 200.—P, pericementum; T, thickness of the specimen; O, osteoid layer of the cementum; D, dentine; L, protoplasmic bodies at the interzonal layer between dentine and cementum.

the cementum. The lamellated portion is followed by a layer, indistinctly lamellated or striated, likewise containing cement-corpuscles and likewise traversed by radiating lines. This layer, either indistinctly lamellated or entirely destitute of lamellæ, we propose to term "the osteoid layer of the cementum," and will devote to its description the next chapter of our paper. At the boundary of the osteoid layer, towards the dentine, a layer of numerous small protoplasmic bodies is seen in our specimen similar to those of an ill-calcified enamel, and probably due to a deficient calcification of the cementum. This layer is rather exceptional. The dentinal canaliculi either stop short of the interzonal osteoid layer, or a limited number of canaliculi is seen to directly run into the interzonal layer where they inosculate with the coarse protoplasmic reticulum.

The aspect of the cement-corpuscles in the distinctly lamellated portion is rather peculiar in ground specimens, mounted in glycerin, when viewed with medium powers of the microscope, five hundred to six hundred diameters. The lacunæ appear filled with protoplasmic bodies, in the centre of which we notice oblong nuclei. From the periphery of the bodies numerous offshoots break forth, which either directly connect neighboring cement-corpuscles, or are lost in the basis-substance. Innumerable fine offshoots are seen to emanate from the coarse ones, and an indistinct net-work is established by these finest offshoots, particularly plain in the vicinity of the cement-corpuscles. The basis substance appears coarsely granular, but no reticulum proper can be made out with this amplification. The basis-substance is pierced by peculiar fibres which intersect the lamellæ at right or acute angles, often bifurcate, and in many instances are independent of the cement-corpuscles or their offshoots, while in other instances they distinctly inosculate with the two last-named formations. (See Fig. 2.)

The question arises, What are these fibres in the cementum? The first idea suggesting itself is that we have to deal with perforating fibres, first described by Sharpey in specimens of dry bone-tissue. Charles S. Tomes[1] says, "Like bone, cementum is also sometimes found to contain Sharpey's fibres; that is to say, rods running through it at right angles to its own lamination, and, as it were, perforating it. These are probably calcified bundles of connective tissue."

Sharpey's fibres are never seen in specimens decalcified by solu-

[1] "A Manual of Dental Anatomy," Philadelphia, 1876.

tions of chromic acid. Histologists assert that they are elastic fibres, not perishable after treatment of the specimen with caustic potash. The fibres in the cementum, on the contrary, are canaliculi in the basis-substance, holding protoplasm, or rather living matter, which feature renders them akin to dental fibres. We propose the name of "piercing cement-fibrillæ" for their designation.

The ultimate analysis of the tissue of cementum is possible only after exposure to a solution of chloride of gold and subsequent decalcification with acetic acid. (See Fig. 3.)

We see the cement-corpuscles, the nuclei of which often appear a trifle lighter than the rest of the protoplasm. The reticular structure of the latter is plain in many corpuscles. Numerous coarse and innumerable fine offshoots break forth from the periphery of the cement-corpuscles. Close around the latter and their coarse offshoots a light rim is present, traversed by the minutest conical offshoots, which rim obviously corresponds to the wall of the lacunæ and canaliculi. The walls are rendered indistinct by the decalcification of the specimen. The whole basis-substance is traversed by an extremely minute reticulum of a dark-violet color, interconnecting all cement-corpuscles. The behavior of this reticulum towards chloride of gold clears up the nature of it: it is the living matter that produces a net-work in the protoplasm as well as in the basis-substance. The meshes of this reticulum, on the contrary, must be considered as the basis-substance proper, composed of what we term glue or gelatine, and saturated with lime-salts. The boundary zone or interzonal layer between dentine and cementum is conspicuous by its bay-like excavations. In this region we easily recognize the union of most of the dentinal fibres with coarser offshoots of the cement-corpuscles, a fact already established by Bödecker. An immediate union of the living matter of the dentine with that of the cementum is fairly plain, since six to eight hours' exposure to the solution of chloride of gold was sufficient to bring to view the reticulum in the cementum, whereas ten hours' exposure is needed, according to John I. Hart, to stain the reticulum of the dentine to a satisfactory degree. No doubt the whole cementum is a tissue, endowed with properties of life in a living tooth, the same as in dentine. Life is not confined to the cement-corpuscles and their coarser offshoots, but extends all through the basis-substance, being attached to the reticulum that pervades the protoplasm, as well as its product, the basis-substance. The study of pathology of cementum has furnished ample proof for the corroboration of this statement.

IV. OSTEOID CEMENTUM.

The tissue of the cementum covering the neck of the tooth is different in its microscopical structure from the main mass of the cementum. In the next chapter we propose to dwell more fully on the cementum of the neck. It is known that the thin layer of this tissue gradually blends with the cementum proper. First the prisms of the neck-layer disappear, and a granular layer makes its appearance, destitute, as yet, of lamellæ and cement-corpuscles, exhibiting a few faint striations, and, as in our specimen, though not constantly, traversed by piercing cement fibrillæ. (See Fig. 4.)

This formation is probably what Charles S. Tomes[1] describes in the following words: "The matrix of the cementum is sometimes apparently structureless, at others finely granular or interspersed with small globules." We wish to term it the "osteoid layer" of the cementum. By the name "osteoid" the histologists designate a tissue kindred to bone, saturated with lime-salts, lacking bone-corpuscles or showing but few of them, and without lamellæ. All these properties hold good for the portion of the cementum under consideration. Its history of development will be cleared up some day, when the development of cementum will be studied in human teeth,—something not as yet accomplished.

The osteoid layer shows, upon approaching the lamellated cementum, a few irregular bone-corpuscles. The lamellated portion starts from the periphery of the root, and soon becomes broader and supplied with regular, freely branching cement-corpuscles, whereby the osteoid structure, in the majority of the teeth examined, is lost to sight. In the specimen from which the illustration is taken, the dentinal fibrillæ stop short of the osteoid layer, a feature so characteristic for the anatomy of the neck. Near the interzonal layer, between the dentine and the osteoid tissue, a few small protoplasmic bodies are seen, into which dentinal fibres inosculate.

Not infrequently the osteoid layer does not perish, even though lamellated cementum has made its appearance; nay, the osteoid layer may be seen all around the root, as an intervening formation between dentine and cementum. Figure 5 is taken from such a specimen. Here we see the beginning of a lamellated formation, between which and the dentine are protoplasmic bodies, with a number of long and parallel offshoots, of the aspect of piercing

[1] "A Manual of Dental Anatomy," Philadelphia, 1876.

fibres. The interzonal layer, in this instance, is conspicuous by a large number of interconnecting protoplasmic bodies, upward in union with cement-corpuscles, and downward with dentinal fibres. This peculiar formation was traceable all along the roots, and means an incomplete deposition of lime-salts at the time of the formation of the cementum. The dentine of this tooth is fully developed, lacking even the so-called interglobular spaces in the crown.

In order to more thoroughly understand the structure of the osteoid layer, we have applied to such specimens the protracted gold-stain, with subsequent decalcification by means of diluted acetic acid; the image thus obtained was a striking one, indeed. (See Fig. 6.)

We observe small, odd-shaped protoplasmic bodies of a dark violet color, exhibiting but a limited number of coarse offshoots. Besides, coarse dark-violet fibres traverse the basis-substance which produce a coarse net-work, arranged without an apparent regularity, and, as it seems, also lacking connections with larger protoplasmic masses. This latter feature may be due to a curved course of the fibres, the union with cement-corpuscles being severed by the process of grinding. The whole basis-substance is seen to be traversed by a, comparatively speaking, coarse, dark-violet reticulum, in union with the protoplasmic bodies, as well as with the coarse fibres. Unquestionably the reticulum is the living matter proper, which endows the osteoid layer with a considerable degree of vitality and sensibility.

The peculiar interzonal formations, represented in Fig. 5, we have also examined with higher powers of the microscope. (See Fig. 7.)

We notice small protoplasmic bodies branching and interconnecting. Their offshoots run upward into cement-corpuscles, or into piercing fibres of the cementum; whereas, downward the offshoots blend with the dentinal fibres. Even the dentine is possessed of protoplasmic formations, a certain distance away from the interzonal layer; all of which proves a deficient calcification just at the time of the beginning of the development of the cementum. The specimen, from which the drawing is made, was not stained with chloride of gold, and not decalcified; hence the reticulum of the basis-substance is only indicated, but not plain. No doubt, however, can arise about its presence.

V. CEMENTUM OF THE NECK.

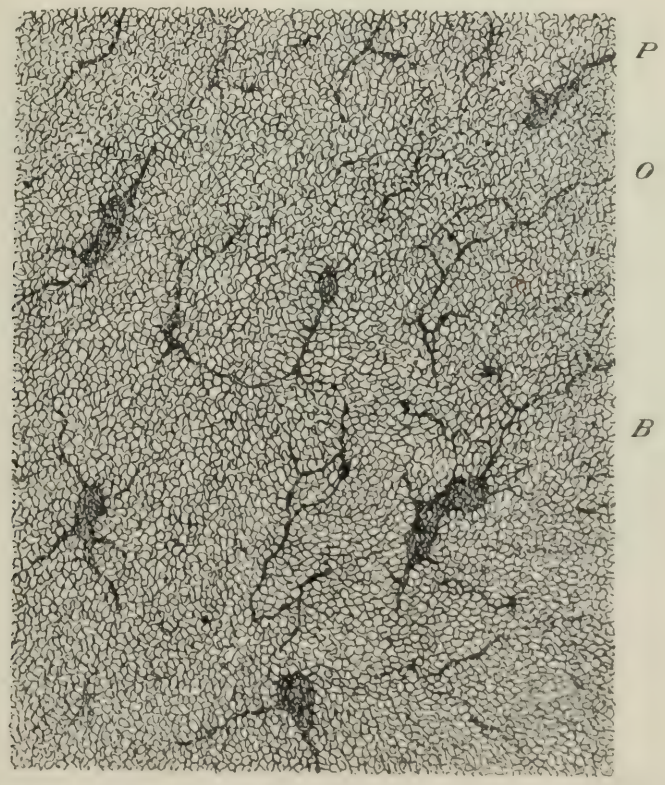
Bödecker, in his above-quoted essay, was the first to accurately describe the minute anatomical features of the cementum of the

FIG. 5



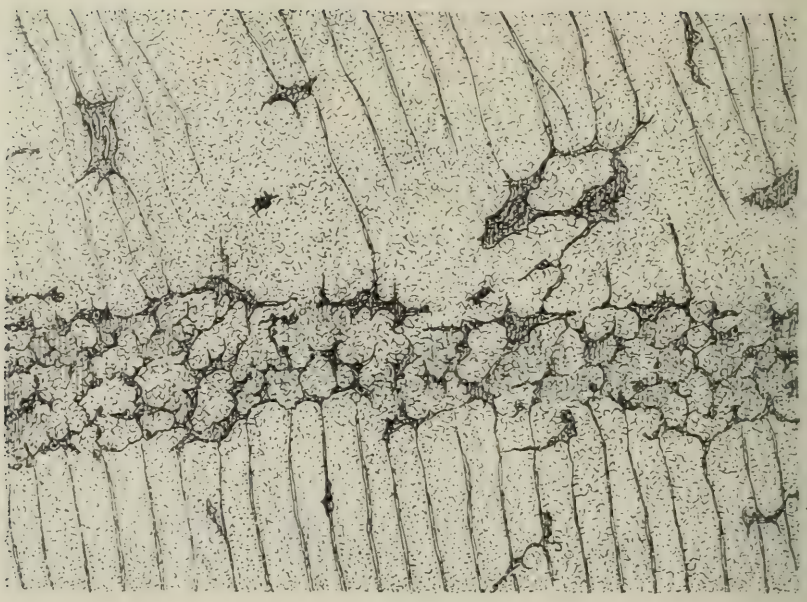
ROOT OF A GROUND MOLAR IN LONGITUDINAL SECTION. TRANSITION OF OSTEOID INTO AMELLATED CEMENTUM. MAGNIFIED 200.—P, pericementum; T, thickness of the speci- en; L, lamellated cementum; O, *osteoid cementum;* Z, interzonal layer between dentine id cementum; D, dentine.

FIG. 6.



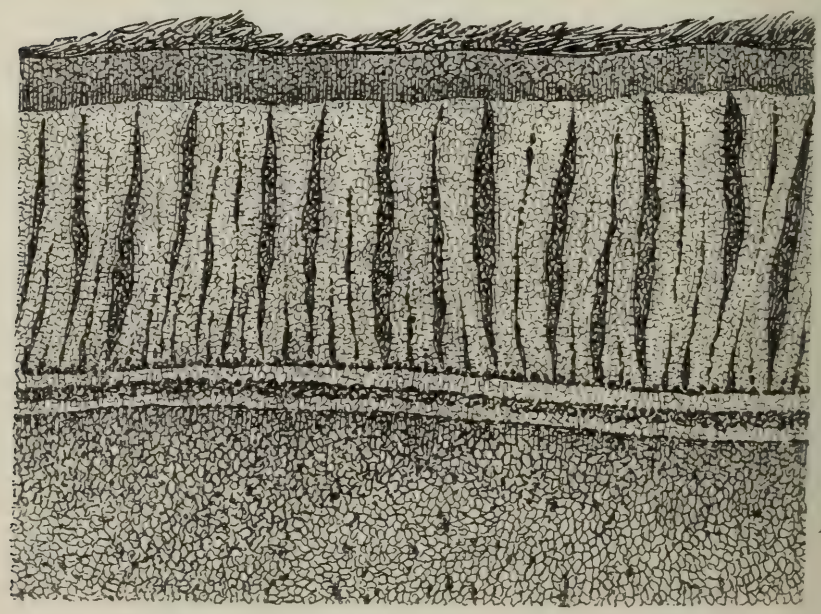
OSTEOID LAYER OF THE ROOT OF AN INCISOR. LONGITUDINAL SECTION. STAINED WITH LORIDE OF GOLD. MAGNIFIED 1200.—P, protoplasmic body, with scanty, coarse offshoots; coarse offshoot, apparently in no connection with a protoplasmic body; B, basis-substance he osteoid layer, traversed by a delicate reticulum.

FIG. 7.



OSTEOID CEMENTUM OF THE ROOT OF A GROUND BICUSPID. MAGNIFIED 600.—O, osteoi layer of the cementum, with scanty protoplasmic bodies and piercing cement-fibrillæ; Z interzonal layer between dentine and cementum, with numerous branching protoplasmi formations; D, dentine with scanty protoplasmic bodies.

FIG. 8.



NECK OF A BICUSPID IN LONGITUDINAL SECTION. STAINED WITH CHLORIDE OF GOLI MAGNIFIED 1200.—P, pericementum; T, thickness of the specimen; N, cementum of th neck, composed of prisms and intervening spindles and fibres; Z, stratified interzona layer; D, coarsely reticulated layer of dentine, destitute of dentinal fibres.

neck. How deficient the knowledge of this portion was, even sixteen years ago, is best shown by a quotation from Charles S. Tomes, who says,[1] "Where the cementum is very thin, as for instance where it commences at the neck of a human tooth, it is to all appearance structureless, and does not contain any lacunæ." The cementum of the neck, as is well known, forms an extremely thin layer, sharply bordered towards the enamel, and sometimes even overlaps the latter. Bödecker speaks of directly calcified prisms which, in his opinion, may be considered as osteoblasts, infiltrated with lime-salts. Sometimes the prismatic structure is not pronounced, but a row of spindles is seen arranged in an almost vertical direction to the surface of the tooth. Larger and smaller spindles alternate, the latter sometimes being so small as to convey the impression of fibres.

There is a slight discrepancy between the statements of Bödecker and our own observations. We fully concur with him as to the calcified prisms; but cannot consider the spindles, sometimes very conspicuous even to medium powers of the microscope, as formations of the basis-substance. We would consider the spindles and alternating fibres as protoplasmic formations, which fill the interstices between the prismatic pieces of the cementum of the neck. This tissue, in our opinion, is either composed of prisms alone, with intervening light and parallel spaces, or of prisms, between which are protoplasmic bodies of spindle shape, alternately broad and narrow, in the latter instance having the aspect of coarse fibres of living matter. Thus the uniformity in the structure of the cementum of the neck is established. We hope Dr. Bödecker, with whom we thoroughly concur in all other points, will pardon our heresy and eventually satisfy himself that our conception renders this structure more comprehensive than his. (See Fig. 8.)

Our view finds support in a drawing of Bödecker's above-quoted great essay, entitled "Anomalous Formation of Cementum of the Neck of a Human Tooth." In this figure dentinal fibres are seen bifurcating, and here and there inosculating with the spindles between the prisms. Such a connection is possible only if the spindles are protoplasmic formations.

Considerable interest attaches to the layer of dentine directly subjacent to the prismatic layer of the cementum of the neck. We are indebted to John Tomes for the knowledge of the fact that the dentinal fibres, in this situation, stop short of the cementum.

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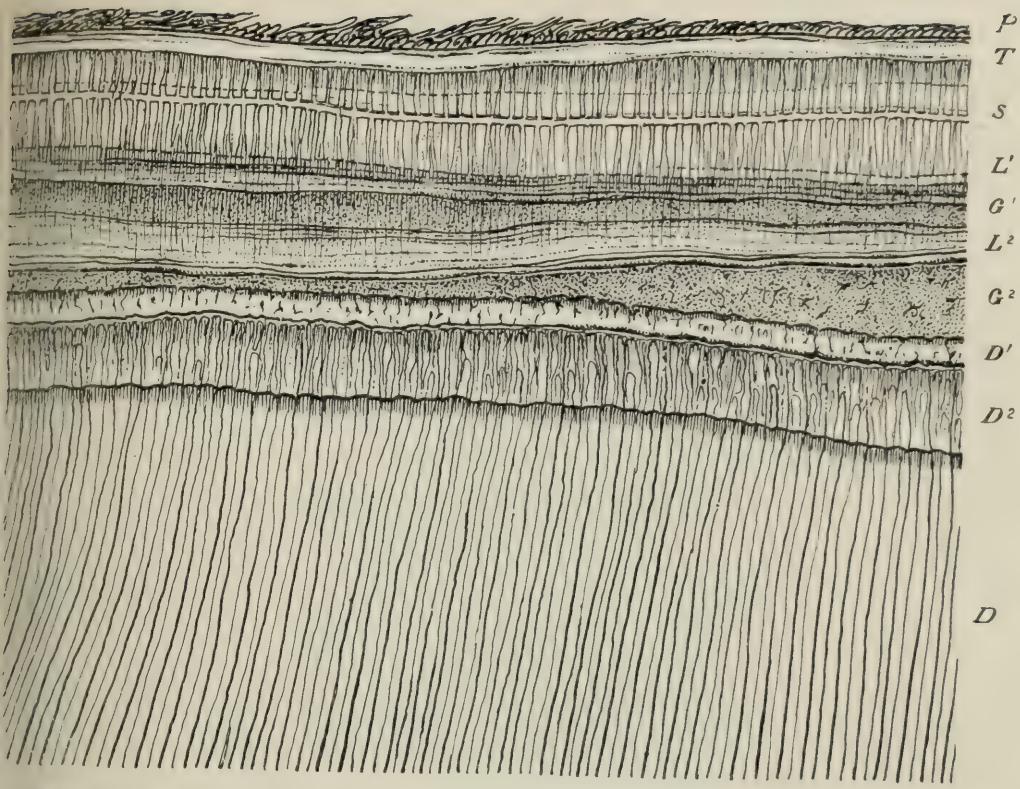
[1] "A Manual of Dental Anatomy," Philadelphia, 1876.

We can say that there is no region in the structure of the teeth varying in aspect so greatly as the dentine in the region of the neck. There are scarcely two teeth perfectly alike in this portion. The simplest form is when the prismatic layer is directly followed by a granular layer of dentine, lacking canaliculi. That the granulation means a rich reticulum of living matter, coarser than in any other part of the dentine, and rendering the neck so excessively sensitive, John I. Hart has proven, fully in accord with Bödecker's statements. This simple arrangement, however, is rare. In many instances there are layers of stratifications between the cementum and the granular dentine, again greatly varying in breadth and in numbers. The appearance of strata, in accord with the conception of John I. Hart, means that alternate layers, rich in living matter, and others scantily supplied with it, build up the neck-region of the dentine. Club-like or pear-shaped spaces, filled with protoplasm, are often seen to pervade the granular layer of the dentine with a peculiar regularity, often in connection with dentinal fibres, which otherwise do not reach the boundary of the cementum. In Fig. 8 we have represented coarse, dark-violet dots in the granular layer of the dentine, forming points of intersection, and far too small to be termed protoplasmic bodies or cells in the sense of older histologists. All these features seem to mean a markedly augmented amount of living matter, which renders all surgical interference in the region of the neck so painful.

The most complicated structure that we have ever seen in the region of the neck is illustrated in Fig. 9.

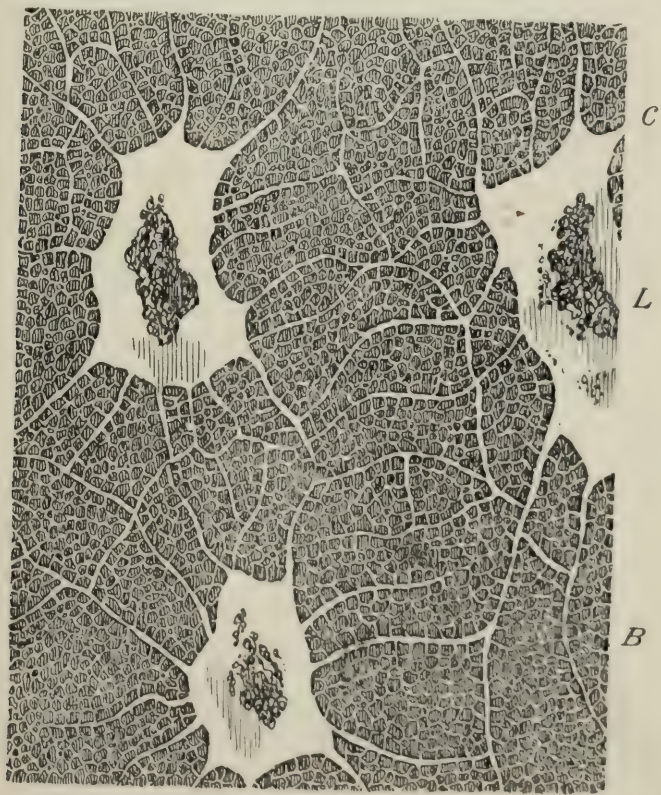
The figure is taken from a bicuspid, showing at its crown a distinct mechanical abrasion, ground by Dr. Bödecker. The stratifications extend all over the root. It is impossible to bring them into a relation with the mechanical abrasion, and we would consider this formation a rather anomalous one. The layers are as follows: The outermost portion, directly bordering the cementum, is composed of large, regular prisms, which show faint longitudinal lines and are halved by distinct fissures in a direction parallel to the surface; this layer extends to the close vicinity of the enamel, and far down along the root, directly changing into stratified cementum, devoid of cement-corpuscles, as far as the specimen shows. This is the only layer that belongs to the cementum, since in the neighborhood of the enamel the dentinal fibres are traceable up to the prisms, pervading a granular basis-substance, as yet but slightly stratified. Soon afterwards the dentine begins to exhibit a number of layers, which may be defined as a narrow outer, and a broad

FIG. 9.



NECK OF A GROUND BICUSPID. ANOMALOUS ARRANGEMENT OF LAYERS OF THE CEMENTUM AND THE DENTINE. MAGNIFIED 200.—P, pericementum; T, thickness of the specimen; S, stratified layer of cementum, composed of halved prisms; L^1, outer lamellated layer; G^1, outer granular layer; L^2, inner lamellated layer; G^2, inner granular layer; D^1, thoroughly calcified glossy layer; D^2, inner prismatic layer; D, normal dentine.

FIG. 10.



CEMENTUM OF THE ROOT OF A DEVITALIZED MOLAR. STAINED WITH CHLORIDE OF GOLD. MAGNIFIED 1200.—L, lacuna, holding shrivelled protoplasm; C, empty canaliculi; B, basis

inner, lamellated stratum, between which lies an outer granular zone, somewhat varying in breadth along the root. These three layers are pierced by extremely delicate radiating lines, which closely resemble dentinal fibres. The next layer is the inner granular, greatly changing in breadth in different portions of the root. This layer holds small, angular protoplasmic formations, and, obviously, corresponds to the granular layer subjacent to the cementum of the neck in normal teeth. Inwardly there follows a zone (D–1) marked by a high gloss, due to an intense calcification of the basis-substance, pierced by scanty angular protoplasmic bodies. The innermost stratum appears to be composed of prisms or spindles, far less regular than those of the cementum. A sharp line of demarcation closes this layer towards the normal dentine, in which not the slightest anomaly can be made out. All these layers are seen down to nearly half the length of the root, where the specimen is cut off.

Stratification is exceptionally observed in the dentine of the roots, consisting of narrow, light lines, arranged parallel to the surface, causing an interruption in the course of the dentinal fibres, but never a change in their direction. Stratification of the dentine at the neck is far more common, but was never seen as yet to such a perfection as in the specimen illustrated in Fig. 9. What the cause of such stratification is, future studies in the history of development of the dentine of the roots and the cementum will elucidate.

VI. DEVITALIZED CEMENTUM.

We have ground a number of teeth which, judging from their naked-eye appearance, were pulpless and devitalized. After exposure of thin slabs obtained from such teeth to the solution of chloride of gold, with subsequent decalcification with acetic acid, the image under the microscope was striking. (See Fig. 10.)

The most conspicuous features were the empty lacunæ, destitute of nucleated protoplasm, but containing granular clusters of a dark-violet color, obviously the shrivelled remains of protoplasm. Numerous canaliculi arose from the lacunæ, all of which were empty. The finest offshoots of both the lacunæ and canaliculi produced a light net-work in the dark-violet basis-substance, an image which corresponds to dry and also to necrotic bone, as first described by Dr. Bödecker. Unfortunately, some specimens of living, freshly-extracted teeth furnished, after the same chemical treatment, identical figures. As mentioned in the chapter on "Methods," such an

untoward result has also occurred to other investigators who resorted to the gold method. The cause of such a failure may be that the extracted teeth were left too long under the influence of the table-salt solution; or, possibly, the acetic acid worked in a wrong way. All we can say is, that whenever such a negative result was obtained, it had affected the whole cementum, so much so that we are at a loss to state whether or not the devitalized cementum is dead all through up to the pericementum. Future examinations, carried out with improved methods, will probably settle the question where the boundary between dead and living tissue is, this being a matter of the greatest importance to the practitioner.

THE HYGIENE OF THE MOUTH.[1]

BY DR. CHARLES E. FRANCIS, NEW YORK.

It is a fact, apparent to every dentist of much experience, that comparatively few individuals in this country pass the first quarter-century of their existence and possess an unbroken and perfectly healthy denture. Even before their second decade of years has been reached, many individuals have suffered the agonies of odontalgia and lost forever a number of their priceless organs of mastication.

The value of sound teeth to members of the human family can hardly be estimated in way of comparison. Health, comfort, personal appearance, and length of life depend much upon their condition or their integrity. To care for them and to rescue them from the ravages of destructive agents is the mission of our specialty, and to achieve such results we bend our energies and direct our best efforts. It is for this purpose that we come together on occasions like the present. Well-organized societies also exist in every part of the land, where all matters pertaining to our practice can be presented and freely discussed. We listen to carefully-prepared essays on all subjects of interest to our fraternity; we have colleges established in various sections of the country for imparting dental instruction, and text-books teaching principles and methods of practice. We have also numerous literary periodicals teeming

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[1] Read at a meeting of the American Academy of Dental Science, May 4, 1892.

with rich thoughts and practical suggestions. We furnish our operating-rooms with the most approved appliances and stock our cabinets with the best instruments and choicest materials that have been devised or can be procured, and, indeed, equip ourselves with everything of value that will aid us in our operations and enable us to make such operations successful and satisfactory. It is, in reality, the one great object of our lives to perfect ourselves in the practice of our specialty; yet, with all our prearranged care and painstaking efforts, we find much that is unpleasant to contend against, much to disappoint our hopes and desires, much to undermine and destroy the results of our care and labor,—and it is on this point that I would direct your thoughts on the present occasion.

Patients come to us for attention presenting cases within the oral cavity of every conceivable condition and desire us to restore or repair all defects or deformities that exist therein. Children are brought to us with teeth crowded, irregular, and oftentimes discolored and decayed. We must gain their confidence, relieve them from pain, repair such teeth as are attacked by caries, remove fragments that are a source of irritation, and put their mouths in a condition of cleanliness. We are called upon to expand dwarfed or contracted dental arches, and bring teeth distorted and out of line into a condition of regularity: and all this to insure their preservation and beauty for many years of life in anticipation. And as those of maturer years come to us, other duties are required that likewise tax our time, skill, patience, and energy,—teeth decalcified and broken; crownless roots and jaws almost or quite edentulous; pulps of recent exposure and sickly pulps or pulpless roots. We are confronted with cases of pericementitis and the various stages of alveolar abscess, necrosis of alveolar borders, and sometimes fistulous openings perforating the antrum, recession of gums, absorption of alveolar process, and teeth loosely rocking in diseased sockets. All these and other disordered conditions are presented to the dentist, who is expected to treat them and care for them in an intelligent way and in the best possible manner. Indeed, he is often considered responsible for the preservation and well-being of the teeth of his patients for all future time.

Now, the ideal dentist may have been well trained in the several departments of his calling and proved himself competent to perform each and every operation given to his charge. He may be skilful and painstaking; conscientious in his endeavors to do the best possible thing for his patients, sparing no effort to perfect his

operations and to make them a permanent benefit; but can he fee sure that after-results will not disappoint his hopes and that a lapse of time will not exhibit a sad reverse of reasonable expectations Does the dentist, in reality, do all that is possible to prevent such unfortunate conditions?

Let us suppose that a patient has submitted to the ordeal o having his or her teeth put in what is usually termed "good order." All diseased roots of broken-down teeth have been extracted, every cavity carefully treated and filled, the teeth all around have been well cleansed, and everything so far satisfactory to both dentist and patient. Does this complete the duty of the dentist towards his patient, and is the latter to be dismissed with no word of admonition,—no advice regarding the future care of the teeth, and no instructions for keeping them in a healthy condition and preventing a recurrence of such troubles as have just been corrected? Perhaps many of the gentlemen before me are in the habit of imparting the needed advice to those for whom they operate, but, if statements of the latter can be credited, many dentists are remiss in this duty, and give no word of heed or warning, nor do they picture the serious danger that such neglect incurs.

I believe that hygenic instructions well emphasized, and admonitions equally emphatic, are essentially important not only for the benefit of the patient, but for the good name and professional standing of the dentist as well. And in caring for the teeth, is not the ounce of prevention worth the sixteen of cure?

Every additional year of individual experience and observation impresses me more deeply with the importance of teaching to our clientele lessons of care and cleanliness to their useful organs of mastication. A famous medical writer and lecturer of your city, in one of his lectures on general hygiene, remarked that "if teeth could be kept entirely clean they would never decay." There is certainly a great degree of truth in this statement. We all admit that decalcification of the enamel-structure and destruction of the lime salts of the dentine are due to or hastened by vitiated accumulations lodged about the teeth. But *perfect* cleanliness of the dental organs is a condition which we hardly expect to find in the mouths of our patients; indeed, as a rule, they are very far from showing this pleasing appearance. It is *not* the simple and easy task that many persons suppose to give their teeth the cleansing they need. There are points here and there which escape the searchings of the tooth-brush, and too frequently they look as if a tooth-brush had never come in contact with their surfaces. People generally

admire fine-looking and cleanly teeth as they behold them in the mouths of those with whom they meet and converse, and all admit that they add greatly to personal charms, yet few individuals give half the length of time and amount of care actually needed to keep their own teeth in a healthy condition. It is doubtful if, as a rule, when making their own toilet before a mirror, they think of scrutinizing or even looking at their teeth; indeed, it is more than likely that at such times they keep their lips rigidly compressed and have but a faint conception of the condition of the organs hidden beneath. If they give them any thought at all, they content themselves with the belief that they have performed the somewhat irksome duty of brushing them; which duty, however, has been done in so hurried a manner as to have but little beneficial effect.

How painfully discouraging to the dentist, who has taken the utmost pains to nicely prepare cavities and make his fillings compact and durable, to find at a subsequent period his work subjected to the damaging influence of vitiated oral secretions! On the principle that like causes may produce like results, teeth having once been attacked by caries are quite likely to again succumb to the elements of decay where conditions remain unchanged. And where fillings give out or prove failures the dentist is supposed to have done imperfect work, so his reputation suffers to a greater or less extent.

It seems to be one of the most prominent failings of human mortals to saddle the responsibilities of their own sins of omission or carelessness upon the shoulders of others, hence members of our calling get more than their share of blame for the ill results of these neglected duties. We therefore owe it as a duty to ourselves, as well as to our clientele, to urge the latter to take especial pains to keep their teeth in a condition of cleanliness, and instruct them also how they can best accomplish this end.

I am aware of the fact that it is not a particularly pleasant duty to charge our patients with a lack of tidiness, and our criticisms may in some instances be viewed as an ungracious rebuke; nevertheless, as we have chosen the profession that calls upon us to preserve human dentures, why should we not make all reasonable efforts to save them from destruction?

Many individuals with very untidy-looking teeth will assert that they use their tooth-brush two or three times a day. Undoubtedly they *imagine* themselves doing all that is necessary, but appearances indicate that their efforts are of little account.

Some will excuse neglected duties on the plea of sickness and inability to do themselves justice, but many are proverbially careless or inexcusably negligent, and suffer their teeth to become thickly coated with limy incrustations. As a matter of course, such accumulations are a source of constant irritation to the gums. Wherever they encroach upon the gingival margins congestion follows, and the dental ligament is severed. As recession thus provoked continues, the mischievous deposits increase in quantity and become incrusted beneath the disturbed margins until the alveolar territory is invaded. This induces absorption of the process, the deposits follow, and thus the work of destruction progresses. Any idiopathic tendency to pyorrhetic socket-disease is sure to develop where such conditions are permitted to continue.

When examining the mouths of my patients, I find few, if any, among them with teeth that cannot be improved if cleansed by the dentist. Even though they may appear white and cleanly to the casual beholder, and fairly well at first glance to the dentist, they can be made to look better and feel better after being nicely cleansed. This operation, however, if faithfully done, is much more of an undertaking than is sometimes imagined, requiring greater length of time and far more care than is usually given ; and I feel that we can hardly be too particular in our endeavors to do this work effectually. I have observed that patients appreciate labor thus bestowed upon their teeth more than anything else we can do for them, and are sometimes profuse in expressions of satisfaction with the improved condition of their mouths.

Perhaps my method of cleansing is much the same as adopted by many of the gentlemen before me, yet it may not be out of order to briefly state it. Provided with sickles and scalers of various shapes and sizes, I usually commence by removing the most prominent scales of what is usually denominated, or *misnamed*, "tartar." The patient is supplied with plenty of tepid water for rinsing the mouth at frequent intervals. On the bracket table before me is a glass slab, on one end of which is a small quantity of powdered pumice-stone and borax, of equal parts, mixed. On the other end of the slab are several pellets of cotton about the size of a pea, and compactly rolled. A towel is pinned about the patient's neck to prevent the clothing from getting soiled when rinsing the mouth, or from the powder, should any fall from the brush. With an ordinary pair of tweezers, or gold-carriers, I pick up a pellet of cotton and saturate it with compound tincture of iodine. With this I paint the surfaces of the teeth, three or four at a time, commencing

with the incisors, and at the same time, with the fingers of my left hand, keep the lips from coming in direct contact with this application. Then with a small brush fixed in the engine and loaded with the powder, I briskly brush away the stains. Sometimes the engine brushes are rather stiff at first to work well on the broad surfaces of the superior incisors, but they lose much of their rigidity if pressed a few times against the narrower surfaces of the lower incisors. The brush is passed along from tooth to tooth, but frequently removed that the mouth may be rinsed. This process is continued until the stains entirely disappear.

After finishing with the brushes, a moose-head buff is fixed in the engine, with which I go over the teeth to give an extra polish to all surfaces it can be made to reach, and call into service, also, wedge-shaped bits of wood, floss-silk, or wood-fibre, to work between them. Then, with a mouth-syringe, I force tepid water through the dental interstices to clear away the débris. After this washing a careful search is made for such stray atoms of calculus as may hitherto have escaped observation, and when no more can be found, I take a finely-pointed syringe filled with listerine and inject a small quantity between the teeth all around. Where the gums are congested, iodide of zinc may afterwards be applied. It is sometimes advisable for the patient to undergo a second operation; and where socket-disease exists, additional and frequent after-treatment is requisite.

The employment of tincture of iodine greatly facilitates the operation of cleansing, and especially is this the case with children's teeth. It has a wonderful and almost instantaneous effect on the dark stains, combining with the latter, which are rendered so soft as to become easily removed. It also clearly defines the lines of concreted mucus, and enables the operator to readily ascertain if any traces remain undisturbed. It should be applied a number of times during the operation, or until the teeth appear quite cleanly.

Now comes the important question, "How can teeth which we have so carefully treated be kept in the condition we left them?" or, "How can habits of thorough, systematic cleansing be imparted and so impressively taught that instructions may be faithfully carried out or practically demonstrated?" This is a matter that has given me much trouble and anxiety.

I have observed that patients are apt to become interested when we take the trouble to explain to them causes and effects: so during my operations, at convenient intervals, I sometimes give them a brief lecture on dental hygiene. In as concise a manner as possible

I explain the causes of decalcification and of socket-disease, and picture the dire consequences of carelessness and neglect; also tell them how they may lessen the chances of such troubles, and secure to themselves sound teeth and healthy gums. Patients need be taught how to manipulate the tooth-brush, and at what times they can use it to best advantage. I advise them to brush their teeth both at night and in the morning, but to be particularly thorough in doing this just before retiring at night. I remind them of the fact that between the last, or evening meal and the morning repast there intervenes a lapse of about twelve hours, and during most of this time the mouth is comparatively at rest. In the mean time, all particles of food collected about the teeth or filling their interstices are undergoing a process of fermentation.

During sleep the salivary glands are inactive, so no fresh saliva is secreted to dilute the acid formations; hence the acidulated agents work in their slow but sure way night after night for weeks and months, until damaging impressions are made on the tooth-structure. An impression once made is sure to be followed by further invasion, until quite a breach is effected on the calcific territory. We have been told that it is during the hours of sleep that the evil one sows tares, and during the hours of sleep the agents of decalcification do their most effective work. If the teeth are well cleansed at night they require but little brushing next morning. During hours of activity they derive benefit from the friction produced by the mastication of food, while fluids taken into the mouth at various times, and saliva freshly secreted, tend to dilute and check acid fermentation. Whenever I find naturally strong teeth with cavities all along their approximal, buccal, or labial surfaces, I am not surprised when inquiry discloses the fact that remnants of food taken during the day are permitted to remain about them through the night. To be sure, there are individuals with such defective teeth who pretend to use the brush at night, but its use is much like a dash and a promise.

I advise my patients to select brushes small enough to go well into the mouth and reach every possible part of every tooth. Brushes with serrated surfaces will better force the food from between the teeth than will flat-faced ones. The bristles should be stiff enough to be elastic, but not too rigid nor too compactly crowded together, otherwise they will simply glide over the surfaces without entering the interstices. On the other hand, very soft brushes, as of badger- or rabbit-hair, are inefficient and of little value. They possess no elasticity, and come in contact with but

little of the surface of each tooth, leaving untouched such places as most need brushing. The same objection will apply to the use of the so-called felt brushes.

In manipulating the brush it is well to adopt some sort of system, and not permit few of the teeth to receive more than their share of attention, while others get little or none. Commence, for instance, with the very back teeth, and work gradually forward towards the centrals; then, with a somewhat quick movement of the wrist, give the brush an occasional semi-rotary motion in a direction *from* the gums. After finishing with one side, treat the other side in the same manner. A suitable dentifrice is essential, which may be improved if the brush is passed across a cake of Castile soap before it receives the powder. On laying aside the brush the mouth should be thoroughly rinsed with water; and finally, some antiseptic agent like listerine, slightly diluted, if allowed to flow around the teeth, will prove beneficial. Such are the instructions given to my patients.

In closing, I must admit that our words of advice are sometimes like seed sown by the wayside, and we get almost discouraged when patients return to us, a few months after their teeth have been well treated, exhibiting sad proofs of negligence. Let us, however, be not weary in well-doing. If we do our part well, we at least have the satisfaction of feeling that we have been faithful to our trust.

CONGENITAL CLEFT PALATE AND ITS TREATMENT.[1]

BY P. W. MORIARTY, D.M.D., BOSTON.

Of the primary cause of this distressing deformity we know nothing beyond the fact that there is an arrest of development about the second or third month of fœtal life.

Dr. Kingsley says,[2] "In a large majority of cases they are the solitary instances in the family. It does not seem to any extent to be entailed or transmitted to offspring."

J. Oakley Coles, in "Deformities of the Mouth," says, "Whether cleft palate is hereditary or not it seems impossible to determine,

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[1] Read at a meeting of the Harvard Odontological Society, held at Boston, Mass., May 26, 1892.

[2] Proceedings of the New York Academy of Medical Sciences, January, 1866.

though from the evidence we have on hand we should come to the conclusion that it is not."

Professor Haughton, of Dublin, thinks diet has some effect on the production of cleft palate, and advised the parents to use food and medicine calculated to promote the formation of bone.

Salter[1] says, "The cause is an arrest of development at an early period of fœtal life, local and very often partial."

Dr. E. S. Talbot,[2] of Chicago, "does not believe in the heredity of cleft palate; if it were so, they should be common among the so-called defective classes." He examined two thousand idiots, eighteen hundred deaf, dumb, and blind, and over eighteen hundred insane, and only found two cases of cleft palate. He thinks "it a purely congenital trouble, the result of defective nutrition. It does not follow that the mother of every child born with cleft palate has not had proper or sufficient food, but the result more frequently comes from perverted function, causing perverted nutrition, and so arrested development."

Dr. Walter Channing, of Brookline, Massachusetts, examined one thousand insane and idiotic patients, and found but three cases of cleft palate.

Dr. T. A. Manley thinks it is due to some nervous influence which we do not understand.

Dr. Edwin Sarcombe[3] says, "Cleft palate must, from the nature of things, have affected the human subject through all time; it must be coequal in antiquity with the other ills to which flesh is heir."

Cases reported which would seem to indicate that it was hereditary are exceptional. When more than one case occurs in the same family, they are simply coincidences; they are the exceptions to the general rule, proving the correctness of the rule that it is not inherited. Except in very rare cases, there is absolutely no evidence of the direct transmission. If it were inherited, there should be a direct and positive evidence of it; it should occur more frequently and the preponderance of evidence should prove it. Scientific men who have seen hundreds of cases, from the knowledge gained from the history of the families in which such cases appeared, agree that it is not inherited.

The theory of heredity is largely a matter of speculation, the

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[1] "Dental Surgery and Pathology," New York, 1875.

[2] *Dental Cosmos*, vol. xxxii. p. 729.

[3] Transactions of the Medical and Chirurgical Society, London, 1857.

corner-stone of all the aristocracies of the world, an excuse for their failures and vices, concerning which no two of the great writers on the subject agree. All agree that certain diseases can be transmitted, because they are due to a germ, microbe, or morbid poison.

Weismann says that the transmission of acquired characters has no existence in fact, that no botanical facts prove the transmission, and that there are not even any facts which render such transmission probable.

The German philosopher, Kant, and Wilhelm His deny that the transmission of mutilations can ever occur, and agree with Weismann that all the so-called facts in support of such a theory are of no greater value than the merest tales.

Lamarck thought that any change in the structure of any part of an organism was chiefly brought about when the species in question met with new conditions in life and was thus forced to assume new habits.

Darwin added the extremely far-reaching principle of natural selection.

The theory of natural selection does not explain cleft palate. What is there in cleft palate necessary or useful, that nature should desire such a change in the structure of the individual? Those mostly concerned are anxious to remedy it. No theory of any of the writers on heredity will account for the cause of this deformity. It is not a diseased condition due to a morbid poison; it has no tendency to increase in the individual. In a great many patients there is no loss of tissue or bone, simply a displacement. The only logical explanation of the cause is that it is accidental, or due to defective nutrition. The embryo during intra-uterine existence is as liable to accidents as is the individual in after-life.

If cleft palate were transmissible, it should increase in a marked degree; it should reappear in the offspring with sufficient frequency to exclude all possibilities of chance. Changes in the structure of the organism, like cleft palate, do not arise from the germ itself, as the human germ plasm develops into the perfect man. This occurs so often that deformities are rare, are the exception, and must be due to the reaction of the body to accidental or external influences. Nature seeks to avoid instead of transmitting deformities. Nature has a horror of them, and will assert itself and return to the normal development.

Cleft palate is found in children born in the mansions of the rich as well as in the hovels of the poor; in the children of the

brainy as well as of ignorant parents. We know it is due to an arrest of development, and science will yet discover what causes the arrest.

We have but few data to base our conclusions on.

I would suggest that blanks based on the following or similar questions be filled out in every case of cleft palate coming into our hands. At some future time we may be able, from observation and the statistics at our command, to throw some light upon the subject.

1. Age.
2. Sex.
3. Assigned cause.
4. Any history of heredity.
5. Mother's condition during gestation.
6. Relationship of parents.
7. Extent of cleft.
8. Condition of teeth.

The child born with cleft palate manages to get nourishment sufficient for existence, and apparently a larger percentage reach adult age than of those with normal palates.

The patients are not conscious of their deformity until they reach the age of six or over; then it dawns upon them, the sneers of their playmates making them aware that it is impossible for them to speak as others do. Then commences a miserable existence for some of the most sensitive of human beings.

The inability to speak correctly is the only and great disadvantage of being afflicted with cleft palate, excepting, of course, a greater tendency to catarrhal troubles.

In 1764 surgery first attempted to remedy this defect, by bringing the parts together. The operation was revived in 1825, since when staphylorraphy was more or less of a success as an operation, but a dismal failure in improving the speech.

The success of mechanical treatment caused surgeons to abandon the operation, but during the last few years the operation has again been revived by German, French, and American surgeons, some of whom claim that the failures to improve the speech was due to a lack of after-training. Another reason given for operating was the expense of a mechanical appliance. This is not a valid reason. No surgeon with the ability to perform an operation will charge a smaller fee than that charged by a dentist for a mechanical appliance, unless he operates upon a charity patient at a hospital even then, in this city, at least, this is not justifiable, as at the Harvard Dental Hospital we insert appliances for the poor at a nominal fee.

Records show that one in twenty of surgical operations are

successful as an operation, but we never see a case where the speech has been made perfect. In fact, the more successful the operation, the greater the injury to the patient, owing to the increased difficulty of mechanical treatment.

The causes of the failure of surgery to improve the speech is that even if the tensor palati muscles are not divided in operating, the palate after an operation is not of sufficient length to close the opening between the cavities of the mouth and nose.

I call your attention to the reports of two cases of only a slight deviation from a normal palate, but in both the power of correct speech was impossible, yet the appearance of both palates was without doubt better than any operation ever could be.

Case I.—Dr. R. Ottolengui[1] reports a case of a palate not cleft, but short, one that would not reach the pharyngeal wall, whose speech could not be understood.

Case II. was a patient of Dr. Hodges, with only a slight fissure of the uvula which rendered the closure of the nasal cavity defective, yet he says, "The palate appeared more perfect than could be obtained by an operation on a congenital case."

Surgeons before operating upon patients should inform them of the success of the dental specialist. Surely in the treatment of cleft palate we all should use common sense, that is, judgment derived from experience, rather than theories, and see facts as they are.

Staphylorraphy should not be performed until surgeons can show or demonstrate that articulate speech can be restored.

Snell, in 1823, was the first who by mechanical means attempted the treatment of congenital cleft palate.

Dr. C. H. Stearn,[2] in 1845, described his appliance for the treatment of cleft palate. Concerning it, Dr. Kingsley says, "His instrument was a marvel of ingenuity. . . . Two principles were vital to Dr. Stearn's instrument,—viz., first, that the artificial velum should embrace the levator muscles of the palate so that it could be lifted by them; and secondly, that it should bridge the upper pharynx behind the uvula and cut off nasal communication at will." The results were marvellous.

Stearn's articles sent a ray of hope to the afflicted, but the appliance was so complicated that his grand idea was lost sight of until Dr. Kingsley, who had given much time and attention to the

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[1] *Brooklyn Medical Journal*, vol. v. p. 529.

[2] *Lancet*, London, 1845, vol. ii. pp. 7, 260, 284, 310.

subject, met him. The master mind of Kingsley was quick to grasp the correct principles of Stearn, and by his ability and ingenuity was enabled to simplify the appliance.

Dr. Kingsley studied the subject as it never was studied before, and science and unfortunate humanity received the benefit of his great work. The profession of dentistry was ennobled by his labors. Dr. Kingsley as an authority on the subject stands pre-eminent. He gives Dr. Stearn full credit for being the pioneer in this work.

We who are here to-night are familiar with the Kingsley appliance, owing to the work of our own Dr. Grant, who is as enthusiastic in regard to its merits as Dr. Kingsley himself.

From my own experience, and the experience gained by seeing a large number of cases which Dr. Grant had treated, I am convinced that Dr. Kingsley's appliance is a remarkable success. The only objection to it is that the velum needs renewing every one or two years, the expense of a new velum being five dollars.

Dr. Kingsley advises the wearing of an obturator of hollow vulcanized rubber after the patient has learned to articulate with a soft velum.

Dr. William Suerson,[1] of Berlin, in 1867 called attention to the action of the constrictor muscles of the pharynx in the production of speech, in the use of his appliance. This was not hollow, but was similar in appearance to the Kingsley obturator, or the Baker appliance, if without the hinge-joint. Suerson's appliance was heavy, clumsy, and rigid, depending entirely upon the action of the superior constrictor muscle. Correct speech, unless previously acquired, would be difficult.

In 1880, Dr. H. A. Baker,[2] of Boston, describes an appliance which he was using with great success. The one I now pass around is similar in construction. It consists of the retaining-plate, to which is attached the hollow bulb by means of a hinge-joint.

The original Baker had a delicate spring to keep the bulb in contact with the levator muscles.

The hinge-joint in any hard rubber mechanism is a necessity, as by its means the levator muscles are utilized in the production of speech.

Dr. Parkinson, in the *Lancet*,[3] in 1867, shows a cut of an appli-

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[1] *American Journal of Dental Science*, December, 1867, and May, 1868.

[2] *Dental Cosmos*, April, 1881. Read before the Massachusetts Dental Society, December 9, 1880.

[3] Vol. i. p. 41.

ance with a hinge and spring, the obturator being made of a flat vulcanite disk. The side view of the same in Salter's Pathology and Surgery[1] very much resembles that of Baker, excepting, of course, that Parkinson's obturator was flat, while Baker's was hollow and of the shape of a chestnut.

Dr. Baker, in his paper read in 1880, describes how he accidentally discovered how to make the bulb hollow, evidently being unaware that Dr. Kingsley described how it was done in the *Dental Cosmos*, May, 1877.

I have seen several of Dr. Baker's patients, and their speech was perfect.

The next appliance which I show you is Dr. Grant's idea, the soft velum of Kingsley being replaced by the underflap and part that goes through the fissure being produced in vulcanite, the upper flap of soft rubber being hooked on to the gold-headed pins screwed into the lower part, this velum-obturator being attached to the retaining-plate by means of a hinge. Dr. Grant uses this occasionally, but prefers the original Kingsley arrangement.

The next one which I pass around is that suggested by Dr. Fillebrown, in which the soft velum of Kingsley is reproduced in hard rubber, and attached to the retaining-plate by means of a strong hinge. This appliance I have used on several patients at the hospital who are at present making rapid progress in acquiring correct speech.

Dr. Fillebrown's ideal obturator, described in the *Independent Practitioner*,[2] we have used at the school in several cases, time will tell with what success. Dr. Fillebrown claims perfect success with it.

The last appliance which I exhibit is the Gibson, described in the International Dental Journal.[3] He clasps buccal surfaces of second bicuspids and first molars extending between the teeth and vulcanized into the rubber or soldered to a gold plate. The obturator is thin, being only an eighth of an inch thick, made of black rubber. It is rigid, but much lighter than the Suerson. Dr. Gibson claims that he has had great success with it.

I intended to have had a patient here to-night who would wear and speak with each of these appliances, but owing to the short time I have had in preparation, and that the patient was unaccustomed to some of them, I deemed it best to postpone it until a future meeting, when, if you desire it, you can have an opportu-

[1] Page 389. [2] Vol. ix. p. 565. [3] July, 1890.

nity of observing the difference, if any, in the speech of the patient while wearing the various forms.

The wonderful success and ingenuity of these men in the treatment of congenital cleft palate reflects honor on the profession as a whole. Those whose labors made this success possible deserve the credit which should be gratefully accorded them. We, their followers, should avoid all false pretences and any approach to quackery. If we invent something new, or improve on an old appliance, in describing it we should not enshroud it in language incomplete in specific details, or seek to keep it a mystery by describing a process which we do not ourselves perform.

To the student who seeks to make himself familiar with the subject I would strongly recommend Dr. N. W. Kingsley's excellent work, "Oral Deformities," and "The Mechanical Treatment of Deformities of the Mouth," by Messrs. Robert Ramsey and James Oakley Coles. These two works will save an immense amount of research.

CROWN- AND BRIDGE-WORK.[1]

BY DR. C. M. RICHMOND, NEW YORK.

(Continued from page 637.)

In my article for this month I give an upper partial case, in which both bicuspids on one side and both bicuspids and one molar on the other are missing.

The patient had worn a gold plate, and came to have it replaced with bridge-work. The teeth remaining all good, I decided to put in a movable case and not cut any of the teeth in the slightest degree. This pleased the patient, as she was extremely sensitive and had been through enough before, and to have a difficult case made and no pain and worry was half the battle.

I first took a plaster impression of the two molars I wished to use in holding the case in position, and cast fusible metal dies. Bands of gold were then made to fit the dies as nearly as possible without the use of a hammer; they were then soldered together at the point where they are to be cut apart after the next band of clasp-metal is soldered on to them.

These bands were made the same as those I have described in a

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[1] Copyright, 1892, by Dr. C. M. Richmond.

former article, by soldering a clasp band on to a gold band which had been previously fitted perfectly to the die of fusible metal, the front or wire support being made of hard wire, or what is termed irido-platinum No. 16. An impression is taken of the six front teeth in plaster, and a cast of a metal die is also made; wire is now cut and bent to fit the shape of each tooth, letting the ends meet at the space at the necks; so it will be seen that this wire part is made of six pieces. After each piece is so fitted as to make a perfect joint, they are waxed together where they meet with a hot spatula and hard wax. This is done on the die; the wire is then carefully removed and invested, leaving the part exposed where the wax is. After the wax is removed the investment is put into the fire and brought to the proper temperature, and each piece of wire is soldered to the other piece, always with pure gold. I use pure gold for the reason that when heat enough has been applied to melt pure gold the wire will be securely soldered, and when solder is used it is not so perfect as pure gold soldering, and will not be strong, while the other is as strong as a whole wire.

The wire and clasps being finished, the clasps are placed in position on the teeth, and a plaster impression is taken, being careful to get the space where the teeth are lost, also the front teeth at the gum-line, perfect. The clasps are now removed from the teeth and placed in the impression. The bands are filled with investment and the balance of the cast is made of plaster; this is all poured at one time. (The reason is, that when I have the teeth placed in position, and the bands and wire and teeth are all waxed together, with a sharp knife I can cut the bands loose from the model and still have them invested.)

After the impression has been cut away we have a model which is a fac-simile of the mouth, with the bands in position. The next step is to place a piece of pure gold, 30 thick, on the model, directly above the position the teeth are to occupy, and by a little care this can be easily and perfectly fitted to the plaster cast by burnishing. After this has been done I place the wire front in position on the model, and the work is then completed up to the fitting of the teeth. The four bicuspids and one molar are selected the right length and width to fill the spaces, allowing enough for grinding the teeth to fit the gum perfectly. Plain plate teeth are used, and, after grinding, they are backed up with pure gold and waxed into position. We now have the bands, the small gold plate on the gum-line directly under the teeth, the wire front, and the teeth all waxed together on the model in the position it is to occupy when

finished. We are now ready for the last investment, and by taking a sharp knife and carefully cutting the molar teeth (which hold the bands) off at the neck, the case can be taken off of the cast, and it has the same appearance that it has in the finished case, excepting that the bands are filled with investment. It is now invested, the solder is melted into position with the blow-pipe until the space between the teeth and the gold plate is filled, the ends of the wire front are at the same time soldered into the case, and simultaneously the bands are fastened to the work.



This case is worn by the patient, who says she is absolutely unconscious of its presence in her mouth, so perfect is the adjustment.

Should the bands get the least sprung they can be at once tightened so that the case will fit as well as when first made.

This class of operations, if they are perfectly made and properly adjusted, are the most satisfactory I have ever prepared, and the operation is applicable to almost all cases.

The case shows one very irregular tooth, and the other one is quite symmetrical and perfect. The bands are left open at the distal surface where the teeth join the next molars, but they could be left open at the point most advantageous to the work. I frequently leave them open, one on the inside and one on the outside, or both inside or both outside, as the case presents itself. Each case has its own requirements, and the operator must use his judgment and skill in mastering the different phases which are presented.

Should any one wish to get the fusible metal I use in these operations, it can be obtained from R. S. Williams, whom I have induced to keep it in stock.

(To be continued.)

PARTIAL SUPPURATING PULPITIS—ORIGIN OF CERTAIN ALVEOLAR ABSCESSES IN LIVING TEETH.[1]

BY ARTHUR C. HUGENSCHMIDT, M.D., D.D.S., PARIS, FRANCE.

CHRONIC localized suppurating pulpitis, that is, a *suppurating* inflammatory process restricted to a portion only of the pulp, such as we commonly observe in teeth in which the pulp has been exposed for a long time, protected only by alimentary particles packed in a carious cavity, can also exist in a tooth in which no communication has ever existed, artificially by instruments or otherwise by natural pathological processes, between the external surface of the tooth or crown and the pulp-cavity. I refer, it must be well understood, to a *localized suppurating* inflammation, and to no other localized non-suppurating inflammatory process which is found in living pulps. In such non-penetrating carious teeth, where such a pulp-lesion exists, provided the conditions I shall hereafter describe are present, the pathological state will manifest itself under the form of a chronic alveolar abscess opposite the end of a single rooted tooth while the pulp of that same tooth is still alive, as it answers to all the principal physiological reactions.

In adult teeth we find such conditions rarely, yet I am convinced that every careful practitioner has certainly met with teeth presenting a fistulous opening opposite the apex of a certain tooth which the operator considered as dead; yet when he attempted to reach the pulp-cavity, to his amazement he finds a highly-developed sensitive dentine; if the neighboring teeth are tested in the same way, they also are found alive, and yet the first tooth is the real seat of the abscess.

While this condition is a rare one in the adult, *per contra* we find it much more frequent in the child, which is explainable, anatomically, by the fact that the apical foramen is very large, as a result of physiological radicular absorption, and I think that a large foramen in the adult, as well as in the child, is a necessity to enable the inflammatory products to make their exit from the pulp-cavity without injuring or destroying the vitality of the dental pulp.

The clinical facts which I have observed on several patients have been as follows:

The patient will present himself suffering from a chronic alveolar

[1] Read before the New York Odontological Society, June 21, 1892.

abscess, an ordinary gum-boil, which might have existed for months, and which is situated at a point on the gum opposite the apex of the root or roots of a tooth. The patient will complain that this abscess opens every day, or every two days, that the rupture of the same is preceded by a short period during which the tooth is sore, is annoying, a pressure on the same relieving the annoyance, but as soon as the abscess opens, everything, all physical symptoms disappear.

On clinical examination of the mouth we find a small, typical, alveolar abscess, about the size of a small pea, rolling under the finger, and situated opposite the apex of the root of a tooth. Examining the corresponding tooth, we find it normal, no caries being present, perhaps a small gold filling. On careful examination, however, the tooth opposite which the abscess exists may be slightly darker in color than the neighboring teeth, but very little so. Of course, the first step in the treatment of such a case, after having excluded in our diagnosis the alveolar abscess of external origin, due to an infectious alveolar arthritis, will be to reach and open the pulp-cavity in which we expect to find a dead pulp; but as soon as the drill has passed the limits of the enamel and penetrated the dentine the patient will begin to complain, and the more we advance the greater the pain becomes, so that, at a certain moment, the pain being unbearable, we feel convinced of having made a false diagnosis, and the cavity artificially formed will be closed with gutta-percha or some other material.

Turning our attention to the neighboring teeth, and, *imagination aiding, we think* that the second one nearest to the fistula is also a little darker, so on that tooth the instrument goes, and as soon as the enamel is passed, we find again sensitive dentine; if the tooth on the other side be opened, also, the same positive results as regards sensibility will be noted.

Now we find ourselves in presence of three sensitive teeth, sensitive not only to the touch, to instruments, but also to extremes of temperature, heat and cold; teeth which respond to a normal sensibility, to a normal state, and yet one of those organs, somewhere, is the cause of this persistent abscess.

Well, if, following our first impulsion—and a first impulsion is usually the good one—we continue our drilling in the first tooth which attracted our attention until we reach the pulp, we shall fall, as may be expected, on a living pulp, and a lively one, too; and if we are careful we shall find in the blood, escaping as a result of the instrumental lesion of the pulp-tissues, a small quantity of pus,

which certainly comes from the pulp-cavity, and from the pulp in particular. It is in such cases that the pulp can be seen beating synchronously with the heart's action, as in such cases it is larger than usual, and the foramen apicale being also very large, *a fortiori*, the blood-vessels of the pulp will be more developed, and any other normal physiological act pertaining to the pulp will be magnified.

If, now, this pulp be removed without tearing, which can be done by injecting cocaine in the gums beforehand, so that the patient be very quiet, we shall be able to observe an ulceration of variable size,—usually a small pin's head,—situated somewhere on the surface of the pulp-organ, usually near the crown, but have also seen it on the radicular portion. Moreover, and this is an important fact, the apical foramen will be found unusually large, and for this reason, as well as for reasons given above, the bleeding produced by removal of the pulp is a profuse one, as if a comparatively large artery had been opened; it can be arrested, however, by tamponing the pulp-cavity.

It will be readily understood that this ulcerative process giving rise to suppuration, the pus will travel all along the external portion of the pulp until it reaches the apical foramen, which, being very large, will prevent strangulation of this organ, which otherwise would occur; from the apical foramen to the outside of the gum the pus will follow exactly the same course as it would in an ordinary alveolar abscess.

In the child, as I indicated above, the phenomenon of radicular absorption increasing much beyond normal the dimension of the foramen apicale, there exists a free communication between the pulp and the peridental tissues; and any localized pathological lesion of the pulp, if it passes at the period of suppuration, will allow its inflammatory products to pass with greater facility in the surrounding tissues through the apex than through the hard tissues of the tooth, which cannot yield unless there should be a penetrating carious cavity.

In the child, clinically, we observe an alveolar abscess larger than in the adult, attaining usually the size of a hazel-nut, and having for its origin a carious temporary tooth, the caries having left exposed the pulp-cavity. If we take away any dentine, the little patient will protest; also, if we inject cold or hot water, which is an indication of the existence of a living tooth; in addition, if we continue our operation, and open the pulp-cavity, we shall find a normally sensitive organ, which will bleed, and at the same

time pus will be seen mixed with the blood, which is indicative of a neighboring suppurating lesion.

Lesions of the pulp have been indicated and carefully studied in a patho-histological point of view by Dr. Arnim Rothmann, of Buda-Pesth, who divided pulp-lesions into: 1. Acute partial pulpitis. 2. Acute purulent partial pulpitis. 3. Acute total pulpitis. 4. Total suppurating chronic pulpitis. According to that author, the first one is due to an inflammatory process which commences under the odontoblastic layer, and only extends to a very limited region. This inflammation is characterized by a cellular infiltration, which is probably due to micro-organisms. The second form is an ulcerous process, which also destroys the odontoblastic layers, and which, according to the duration of the disease, extends more or less deeply into the tissues of the pulp; if this second form lasts too long it becomes a total acute pulpitis. Finally, total suppurating chronic pulpitis is a chronic process, beginning in the centre of the pulp and extending slowly to the periphery. The diagnosis of these different lesions have been verified, according to the author's statement, by extraction of the involved teeth.

Dr. Rothmann does not mention the existence of a *chronic localized* suppurating pulpitis, and yet I am convinced that such is the lesion observed whenever a pulp has been long exposed and has not died, and also that such was the lesion which I observed in living teeth presenting abscesses, the histories of some of which I sent to the American Dental Association in August, 1890.

This chronic localized suppuration does not offer very characteristic clinical signs, and to establish our diagnosis we must satisfy ourselves with the three following facts: First, the presence of a chronic alveolar abscess, or dental fistula, opposite the apex of the root of the suspected tooth; secondly, to a more or less deep discoloration of the crown of the tooth as compared to the neighboring ones; thirdly, the indication given by the patient that the suspected tooth is the seat of an annoyance, of an obscure pain, when the abscess was forming.

When these three signs are present, and the neighboring teeth are not devitalized, one must not hesitate to trephine the suspected tooth, notwithstanding the dentinal sensibility which will be encountered, and surely, if the pulp be carefully removed, the origin of the trouble will be found.

As a conclusion, I think I can state that living teeth in adults, as well as in children, can give rise to an alveolar abscess.

GOLD ADDED TO COPPER ALLOY.

BY J. E. REGISTER, D.D.S., DOVER, DEL.

In chemical reactions the resulting compound is always entirely different in its characteristics from any of its component parts; and this fact has strengthened me in the belief that there is great advantage in adding gold to copper alloy, to strengthen the latter in its resistance to the attacks on it by substances in the mouth,—many supposing these to be either sulphur, forming a soluble sulphate of copper, or acetic acid, forming a soluble acetate of copper. My theory leans more to the latter, as I believe acetic acid is the more readily formed in the mouth, owing to the acetic fermentation of the ingesta lodged in and between the teeth.

Dr. H. C. Register, of Philadelphia, suggested to me this treatment of copper alloy; but as it is yet a theory, I hope every operator reading this article will give it a trial, and if happy results follow, one of the best antiseptic filling-materials will be saved to dentistry. I will give my manner of preparing and inserting the alloy. The mercury is first prepared by placing in a small glass vial one ounce of the best redistilled mercury, and to this is added one leaf of No. 4 adhesive or soft gold-foil; shake the vial thoroughly for fully five minutes, and at the expiration of this period the gold will be found to be thoroughly dissolved. In this state the mercurialized gold (the name I have given it) can be kept any length of time, and is always ready for use. Then take an ingot of pure copper alloy, the requisite size to fill your cavity, and hold it over an alcohol flame till small beads of mercury cover the entire surface of the ingot. Then place it in a mortar and grind with pestle till of a smooth, soft, pasty mass; place this mass in a chamois-skin, winding it up tight, and, with the assistance of heavy, flat-nosed plyers, squeeze all the free mercury out. Place this flat, dry cake in a mortar and grind with pestle, adding to it enough mercurialized gold to make a soft, pasty mass. Take this mass and squeeze one-half of it between the finger and thumb to the consistency of stiff putty; take the other half and wind tight in a chamois-skin, and with plyers squeeze very dry. Fill the cavity first with the softer mass, and as the free mercury comes to the surface, add small pieces of the dry, till all the free mercury is taken up and the filling is solid and firm. Then burnish and instruct the patient not to disturb it in any way for at least from twelve to twenty-four hours. Now, as to whether this gold added

will meet with the results desired will take several months to thoroughly test. "In the multitude of counsel there is wisdom," and with the numerous readers of this journal there may be many who can suggest some way of better manipulation. If so, I, for one, would gladly hear from them; and also hope many will give the suggestion a trial.

Reports of Society Meetings.

NEW YORK ODONTOLOGICAL SOCIETY.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, June 21, 1892, at the New York Academy of Medicine, the Vice-President, Dr. Brockway, being in the chair.

There being no incidents of office practice or casual communications, the chairman announced the two papers which were to be read,—namely, "A Contribution to the Minute Anatomy of the Cementum," by Prof. Carl Heitzmann and F. A. Roy, M.D., D.D.S., of New York, and "Partial Suppurating Pulpitis—Origin of Certain Alveolar Abscesses in Living Teeth," by Dr. A. C. Hugenschmidt, of Paris, France.

(For the above-mentioned papers, see pages 709 and 741, respectively).

Dr. Littig.—I notice that there are very few gentlemen present who understand the first paper on the list. There would probably be no discussion of it, and I think we had better have the papers read by title only, and published in the Transactions, and we can read them at our leisure. They can be printed as our usual proceedings, without any discussion.

Dr. Heitzmann.—I am perfectly willing to read the paper. I have to offer a number of drawings; they are few in number, but perhaps the quality will make up for the quantity.

Dr. Howe.—On the subject of the motion, I do not see any objection to it whatever, unless there is some one present who wishes to discuss the subject. I would rather favor the idea of passing the papers without reading them, if it meet the approval of those present.

Dr. Lord.—It would seem very desirable to hear what Dr. Heitzmann has to say on the subject of the paper. He has un-

doubtedly read it, and he should give us his views, which may be lost entirely to us if we do not get them this evening, to be published with the paper, and if there are others who wish to discuss the paper, as has been remarked, it would be desirable to have it read.

Dr. Heitzmann.—I have to remark that a slight alteration was made in the title of the paper. Dr. Roy is engaged in practice in New Orleans, and I therefore had a little more work in getting up the text than usual; consequently my name appears with Dr. Roy's on the paper. I have therefore no views to announce different from those in the paper. What will be printed is exactly what I mean on the topic.

A motion was then made that the papers be read by title and passed, which was carried.

Dr. Remington.—I would suggest that if any one present has anything to say on the subject of the second paper, that he be invited to do so.

As none of the gentlemen present desired to speak on the paper, the subject was passed.

Adjourned.

AMERICAN ACADEMY OF DENTAL SCIENCE.

The regular monthly meeting of the American Academy of Dental Science was held in the Boston Medical Library Association rooms on May 4, 1892, President Brackett in the chair.

The paper of the evening was read by Charles E. Francis, D.D.S., M.D.S., of New York; subject, "The Hygiene of the Mouth."

(For Dr. Francis's paper, see page 724.)

DISCUSSION.

Dr. Fillebrown.—I heartily commend Dr. Francis's paper. It is upon a subject which, to be sure, is familiar, but one which gets much neglected at times. His instructions to his patients are very valuable.

I was glad to hear his mention of the use of iodine as a cleanser of the teeth. This use of iodine is not so general as it should be. I once advocated its use in an article and was criticised by *The Journal of the British Dental Association.* This past year one of my patients, whose teeth I have had the care of for many years, was in Europe, and called on one of our prominent American dentists there and had her teeth cleansed. During the process she

asked him if he did not use iodine. "Why, no," said he; "it would ruin the teeth." The lady laughed and told him that she had had it used frequently and had yet to see any harm from it. I have proved that it is not injurious. I put a tooth in a bottle containing the tincture of iodine and allowed it to remain there for three or four months. I then removed the tooth and let it soak in water to remove the iodine, and then sawed the tooth completely in two. After soaking for nearly four months in the tincture of iodine, the tooth was just as sound and perfect as it ever was. If there is any member present who does not use iodine in the way described by Dr. Francis, I hope that he will try it at once, and advise his friends to do the same.

Dr. Andrews.—I wish to say that I have found it excellent in removing green stains. I am in the habit of using, also, peroxide of hydrogen together with the pumice and the iodine, and I think with those three materials you can meet any case.

Dr. Banfield.—Can any one tell me what compound forms in connection with this green stain?

Dr. Williams.—It has been known for some time that iodine, followed by ammonia, would take off nitrate of silver stains. I have forgotten just the chemical combination, but there is an accurate scientific reason for it.

I was much pleased with the paper; there were one or two points in it that I was particularly glad to hear mentioned. One of them was the fact of the dentist being blamed for more than he is responsible for. The essayist spoke of the importance of faithfulness in cleaning, etc., but how long do the cleansed teeth remain clean? I could not help recalling a case of old Dr. Joshua Tucker which he related some thirty years ago. He had put in some fillings and cleaned the teeth of a gentleman, leaving the mouth in very good condition. In the course of six months or a year the patient returned, and in looking his teeth over he found that one had decayed in an approximal cavity where he had placed a filling, and the patient began at once to blame him for not filling the tooth properly. The old doctor said to him, "The mischief started there and I stopped the decay; now it has started again in the same place and from exactly the same cause. Do you think I can do better than the Almighty?"

I always think of that when I hear dentists bemoaning so-called failures as if from lack of faithfulness in filling teeth, when, in many cases, it was from no fault of the operator, but came from just the same cause as produced the original decay. We should

not always be blaming ourselves or others when we see mischief rampant.

In the matter of brushing, sometimes patients in their zeal to use the brush will get a tension on the lips and muscles of the mouth and face which prevents the free motion of the brush over all the teeth. I always tell them to let their muscles hang as lax as if they were going to sleep, and then they can get their brush anywhere, and will be likely to brush more thoroughly. I prefer a brush with fine but elastic bristles, not too closely set. This has the effect of a moderately soft brush, and not the harshness of a stiff brush. There is one great fundamental fact to be borne in mind in allowing children, or even adults, to use too stiff a brush, —they insensibly, if not consciously, avoid getting it near the gums. By using a softer one there is no danger of injuring the gums, and it can, with the proper motion, be used all over the teeth. The motion that I direct is a circular one, corresponding nearly to the diameter of the teeth. In this way you get a continuous friction into the spaces and around the curves of the gum. I also recommend to patients the use of the rapier-pointed quill toothpick, not too stout, but so thin that it will soon soften in using. Of course there are spaces that you cannot get at with this, and you have to use floss silk. But I recommend this kind of quill because it is so well adapted to reach up under the gum. With the obtuse wooden toothpick you press material up into those crevices and keep it there.

Dr. Francis.—I have used borax successfully, especially in connection with inflamed gums, and in many cases of pyorrhœa alveolaris. It is an antacid, and, to a certain extent, an antiseptic. I direct patients to wet the tip of the brush, and pick up some of the borax with it and place it on the gums; wait a few seconds until the crystals are partially dissolved, and then whirl the brush without scratching the gums. The borax dissolves and penetrates the viscid material that lies directly at the necks of the teeth, and you can then brush it away.

Dr. Andrews.—There is one point that I did not quite catch. The essayist spoke of the iodide of zinc for congested gums. I should like to know a little more about this material and its action.

Dr. Francis.—Iodide of zinc is one of the best astringents that can be used in the mouth. It was first suggested to me by Dr. R. T. Lincoln, a New York specialist of throat and lung diseases. He told me that he applied it in throat troubles, and it occurred to me that it might prove effective as an application to inflamed gums.

You can easily prepare the iodide of zinc. It is a combination of compound tincture of iodine and sulphate of zinc. The formula of the former may be found in the "United States Dispensatory." The sulphate of zinc should first be a saturated solution. They must be carefully combined, otherwise the iodine and zinc will both precipitate. Dilute the compound tincture one-quarter with alcohol, and dilute the solution of zinc three-quarters with water. Pour slowly, drop by drop, the solution of zinc into any given quantity of the solution of iodine until the iodine shows signs of precipitation. I use it much in cases of socket-disease, and find it an excellent preparation to inject into the pulp-canals of roots in treating alveolar abscess.

Dr. Williams.—I have had some experience with that material myself, using it with great benefit in some cases of pyorrhœa alveolaris.

Dr. Fillebrown's mention of the dentist who thought iodine injurious reminded me of a similar experience that I had in relation to the use of borax. I had used it for some years, and a patient of mine, who understood its use, recommended it to a friend of hers. Afterwards that friend had occasion to go to her dentist and she mentioned, casually, that she had been using borax. "Why," said he, "you will ruin your teeth with borax." In November, 1889, I put some cuspid teeth in a bottle containing a saturated solution of borax. I looked at them yesterday, and the teeth were unchanged.

Dr. Clapp.—One of the best results of our meetings is in keeping us up to concert-pitch for our daily work. We cleanse teeth day after day, and I, for one, sometimes get tired of it. Certainly, if there is anything that needs doing thoroughly, it is the cleansing of teeth, and it is well for us often to consider this matter.

I use most of the methods Dr. Francis has spoken of, and in addition floss silk, and when I am not too tired I instruct patients how to use the silk themselves. Almost invariably the question asked by the patient while you are cleansing the teeth is, "How can I keep this tartar off my teeth?" I reply that I know of but one way, and that is by using floss silk. Then, giving the patient a mirror, I demonstrate its use. Another time for using floss silk is after using pumice. It removes all the particles of pumice and calculus that remain between the teeth, and leaves the mouth in a much more comfortable condition. The syringe will not remove all of the débris.

Another preparation that I have been in the habit of using in the place of iodine is a formula composed of tincture of iodine and

glycerin, equal parts; to one ounce of this mixture add ten drops of carbolic acid (deliquesced crystals). I don't know that this will act quite as readily on the green stains as the plain tincture of iodine, but it is much less disagreeable to the patient, and it will act nearly as well. It is also remarkably adapted for congested and inflamed gums, and it is almost a specific for cracked lips. We have a large number of patients coming to us in the winter-time with cracked lips, and it is certainly a very painful and disagreeable trouble.

Dr. Francis has spoken of listerine. I would like to ask him if he fears anything from its acid nature. It has quite a strong acid reaction from the boracic acid contained in it. I am in the habit of using it, and in the mouths of patients who are troubled with what we call tartar I have recommended it freely.

Dr. Francis.—I believe that a single drop of milk, if left to ferment in the mouth over night, will work more mischief to the teeth than could possibly result from a free use of listerine. I never like to advertise patent nostrums, but I have witnessed such excellent results from the use of this preparation that I feel impelled to refer to it favorably. I know of no other mouth-wash which has proved so reliable, and in some cases where I have found teeth in such a condition that I almost despaired of saving them, they have been kept well by the use of listerine. Some of the best-preserved teeth that I have seen are in the mouths of those who habitually use it.

It has been remarked that the application of iodine to the teeth is unpleasant to some persons; but not once in fifty times where I have used it has any such complaint been made. I have, however, in a number of instances, had patients speak of it as a "pleasant-tasting" application. It is invaluable when cleansing teeth for children, because it shows up the stains and renders them easy to remove.

Viewing the case either theoretically or practically, we need fear no harm from the use of either iodine or listerine in the mouth. If any person present has never tried iodine for cleansing teeth, I would advise him to do so. It will disclose stains not easily discovered without applying it.

President Brackett.—I remember a score of years ago, in my student days, it was my privilege and advantage to have some excellent instruction and advice upon the subject of cleansing teeth. I am sure it will gratify every one of us to hear Dr. Moffatt speak on this subject.

Dr. Moffatt.—The subject of the cleansing of patients' teeth by the dentist has always been one of great importance in any practice. I have always insisted that the dentist should put every one of his patients through a course of careful inspection for the cleansing of their teeth, some needing it once a year, some twice a year, others three or four times a year. When I held the chair of Operative Dentistry in the Harvard Dental School, I endeavored to instruct the students as well as I could upon the importance of this subject.

I had a system of cleansing the teeth and a set of suitable instruments for doing so. Commencing with the lower central incisors, I passed around on one side as far as the wisdom-tooth, then in the same way with the other side, and then proceeded to the upper ones, carefully inspecting every tooth, and getting it as nearly clean as possible.

Dr. Francis made one suggestion in his paper that I do not quite agree with, and that is with regard to the free use of tepid water during the operation of cleansing the teeth. There is more or less bleeding at the time, but I think the use of so much water is a little injurious: it dilutes the fluids of the mouth too much and also the blood. I generally get along as much as possible without it, allowing the patient to free the mouth with saliva. At the close of my cleansing, then I give a little tepid water and use a little tannin.

I quite agree with him in the use of iodine and of listerine. One thing that I have generally used in connection with listerine is a little glycerin.

Some one asked what was the combination produced by the use of iodine in removing stains. I think I can make that clear. These stains are usually produced by iron. By the application of iodine we form the iodide of iron, which is soluble and easily removed by polishing.

The cleansing of patients' teeth is one of the most important duties of the dentist, and most dentists, I am afraid, shirk it a little. I always give patients a lecture on the use of the brush and floss silk, and to a business man I always recommend the use of little rubber rings, such as he is apt to use in his business; these will do the work nearly as well as floss silk.

President Brackett.—I have been noticing our worthy member from Salem taking notes. Perhaps he will give us the benefit of his ideas.

Dr. Meriam.—I like to make notes as I hear things.

Regarding the use of iodine, of course we know that it belongs with bromine and chlorine; all of the group have bleaching properties. I don't know who introduced it in dentistry; I found it in use at the Harvard Dental School in 1871.

Dr. Moffatt.—If Dr. Meriam will allow me, I think the credit of introducing it is due to Dr. Thos. B. Hitchcock.

Dr. Meriam.—Thank you. I think that should go on record.

There is one thing that should be noticed, and that is the care of children's teeth when they are too small to come to the dentist. The nurse who has the care of the children can take one tooth at a time and attend to it, whereas in our office it would be too much for the little one's patience, and we cannot afford the time. For that purpose the best thing to use is a piece of rattan, cut to a point like a pen. I think the use of rattan for cleansing teeth came from Dr. Williams, and I have now several hundred rods of it in my cellar that I use for gardening and other purposes. I think it can be had at almost any furniture-store.

Another thing that I like to use is elder piths. They can be bought in bunches and are soft as chamois skin, and little pieces can be used in the final polishing.

Following the pumice, we can use oxide of tin. That was formerly used a great deal, and I always keep some on hand. I get it from Metcalf's in the wholesale department, and if it is not in any ordinary chemist's list, you can get it by sending there.

The rapidity with which anything acts in the mouth should be remembered. Heat and moisture are the great factors in the germination of plant life, and as every growth in the mouth so far discovered has been vegetable, we should keep that in mind. If you will notice a glass of water standing in a room, you will see how quickly the sides of it become coated. You will also notice how quickly the spores of ferns will germinate in a hot-house, small ferns often coating the sides of pots. I have often thought that as spores of plant life develop so rapidly, how important is it that we should use mild alkalies in cutting or dissolving away the mucous coating which is so easily formed.

There is one thing to be remembered, however, and that is the increased power of dilute medicines in proportion to that of their powder form. If we are to use anything as a medicine, I prefer a solution; but if we want it as a polisher, then I would use powder. Two years ago I completely cured a case of erosion by the use of a wash. All the front teeth were being rapidly eroded. I recommended the use of alcohol, the instructions being

to get a burning in the mouth twice a day. The object of this wa to reach the mucous glands that were giving out acid, and to giv them a stinging so as to change the character of the fluids.

Dr. Clapp.—I would like to speak of a different use of iodin and ask if any one has ever employed it in this way. During th year 1869 I had the pleasure of being, for about six months, i the office of the late Dr. Coffin, in London, and in the excavation c cavities he always used iodine. When the cavity was partiall excavated, he introduced in it a little of the tincture of iodin thereby getting the same result which we get on the stains of th teeth when we use it for cleansing. He seemed to think that there was anything remaining in the cavity that was devitalize it would be colored and detected at once. I don't think he eve excavated a cavity without employing it.

Dr. Williams.—Did he depend upon excavation to remove th stain of the iodine, or did he use something for that purpose?

Dr. Clapp.—Nothing more than water. As I understand i iodine will not discolor sound dentine; the color remains only in th dead portion, which of course has to be excavated.

Dr. Meriam.—One thing I omitted to mention, and that wa pine-sticks. An excellent way to get them is to use the unpainte pot-plant labels. They are made of soft pine, usually straight an clean, and I get perhaps five hundred of them for a small sum, fron seedsmen.

Dr. Eames.—As a finisher to my operation of cleansing I hav used, with great satisfaction, fine, antiseptic, warm spray, give with a good deal of force such as you can get with a compresse air-tank or the foot-bellows. This is like a searching wind an rain which finds access to otherwise inaccessible parts. This warm spray used with force seems to drive all particles from the neighbor hood of the teeth. I have experimented with the hand-ball atom izer to get a spray which patients might use, but it does not giv sufficient force to accomplish the object.

Dr. Smith.—The essayist spoke this evening of passing the brush over Castile soap before using tooth-powder. I have felt that the use of Castile soap was injurious in many mouths. I came to this conclusion from observation, and also find that Dr. Garretson speaks of soap as having a tendency to produce recession of the gums. I do not know of a case that has come to my notice of extreme sensitiveness about the necks of the teeth where the patient would not answer "Yes" to the question, "Do you use soap?" I have prohibited in those cases the use of soap, and in

nany the sensitiveness has entirely disappeared without any treatnent whatever. Dr. Shaw, whom some of you know has experimented in that direction on his own teeth, says that if he uses t tooth-powder with the slightest trace of soap in it his teeth will oon become so sensitive that the drawing in of air will produce ain, and that by changing for a powder in which there is no soap resent, and with no other treatment whatever, that sensitiveness ntirely disappears. I believe that dentists recommend Castile oap altogether too freely.

Dr. Moffatt.—I have had patients ask me, "What makes my eeth look so yellow and dingy?" I reply, "If you will give up sing soap and get some powder that has a little friction, it will robably improve the appearance of your teeth." The fact is, at soap makes the mucous secretions of the mouth thick and eavy, and they stick to the teeth, and that covering is not readily moved by the brush, and so the teeth look dirty. The idea of sing soap is apparently a very good one, but in the mouth it oesn't work well.

Dr. Andrews.—I have found the same trouble with soap that r. Smith speaks of: it is likely to produce recession of the gums.

Dr. Williams.—You can over-stimulate the gums and make them cede by too much brushing. In regard to the discoloration of e teeth referred to, you cannot keep them white unless you use me powder with the soap. The soap acts as a lubricator for the rush.

Dr. Harris.—I would like to hear a few words on this subject om Dr. Stanton, President of the Harvard Odontological Society.

Dr. Stanton.—The subject has been so fully discussed that I nnot add to what has already been said. Dr. Andrews spoke of e use of peroxide of hydrogen as one of materials which he uses. would like to ask if he has noticed any effect from the hydroloric acid in the peroxide of hydrogen. As I understand it, in e manufacture of peroxide of hydrogen the makers are obliged acidulate the water with a small quantity of hydrochloric acid. y attention was called to the matter by one of my patients, who ked if I thought it injurious for her daughter to gargle her throat th peroxide of hydrogen. The child's teeth were not in very od condition around the margins of the gum, and I suggested at she bring me a small quantity of what she was using. She l so, and I tested it. It surely contained a small quantity of d, although it was a difficult thing for me to get an acid reaction. an experiment, I then tested some of Marchand's, such as we

get from the stores, and I found that it was very strongly acid, and it occurred to me that in children's teeth, where they were disposed to decay around the margins of the gum, it might possibly be injurious.

Dr. Andrews.—I was cautioned in the use of peroxide of hydrogen by what Dr. Rollins said in regard to it. I have used it with care, and, as far as I can see, there has been no injurious action as a result.

As to listerine, one can see how very acid it is when they test it. It turns blue litmus-paper red, and I have been cautious in recommending it, telling patients to use it no stronger than one-third listerine and two-thirds water. Recently I have been using phenol sodique a good deal instead of listerine, and I like it quite as well, or better. It is an antiseptic, and I use it for retarding the action and growth of germs in the mouth and teeth.

Dr. Meriam.—The use of these things is very general, and the manufacture of them is closely followed up by the various druggists, so that it is quite easy to obtain the various formulas for listerine, etc. It seems to me that the profession is getting numerous enough now to have a book of formulas, as some of the hospitals have, and it would seem as though we ought to have preparations made for us as we wish them, and see to it that they are not injurious. For instance, we could have a listerine possessing its present virtues with the acid left out.

William H. Potter, D.M.D.,
Editor American Academy of Dental Sciences.

AMERICAN DENTAL ASSOCIATION.

First Day.—Evening Session.

Meeting called to order by the President, Dr. W. W. Walker.

There being no miscellaneous business, Section VII., Anatomy, Pathology, and Surgery, rendered its report through its chairman, Dr. T. W. Brophy, an abstract of which report follows:

Relative to articles which first appeared in medical journals, and afterwards were reprinted in dental journals, the name of the journal will be given so that members may have easy access to them. Articles have appeared in periodicals on the following subjects on anatomy, pathology, and surgery.

"Maxillary Cysts connected with the Teeth." By Ludwig Hegtone. *Dental Review*, September number.

"Necrosis of the Maxillary Bones: A Sequence of Measles." By Dr. McCarthy, Dubuque. *Dental Review*, September, 1891.

"Affections of the Salivary Glands and Tissues in Close Proxmity to them." By Dr. T. W. Brophy, December, 1891.

"A Brief Treatise on the Common Diseases of the Maxillary Sinus." By Dr. Schuhmann, March, 1892.

"Recent Contributions to the Diagnosis and Treatment of Emyema of the Maxillary." By Dr. Morgenthau. *Dental Review*, April, 1892.

"Notes on the Anatomy, Physiology, and Pathological Significance of Pain, and the Nervous Phenomena in Relation to Dental Diseases." By Dr. Gaddes. *Dental Review*, July, 1891.

"Necrosis: Its Microscopical Appearance, Causes, and Treatment." By Dr. D. M. Sabater. *Dental Cosmos*, 1891.

"The Human Mouth as a Focus of Infection." By Dr. Miller, of Berlin. *Dental Cosmos*, September, 1891.

"Diseases of the Oral Mucous Membrane." By Dr. Patterson. *Dental Cosmos*, 1891.

"Senile Atrophy of the Upper Jaw." By Drs. Abbott and Heitzmann. *Dental Cosmos*, January, 1892.

"Pathology of Trifacial Nerve." By Dr. Freeman. *Dental Cosmos*, 1892.

"Studies on the Anatomy and Pathology of the Tusks of Elephants." By Dr. Miller. *Dental Cosmos*, 1891.

"Dental Devices for correcting Deformity attending the Extirpation of the Left Half of the Inferior Maxilla." By Dr. Westlake. *Dental Cosmos*, 1891.

"Fracture of the Maxilla by a Gun-Shot Wound." By Dr. Patterson. *Dental Cosmos*, 1891.

"Where Dentistry looks over into Oral Surgery." By Dr. Curtis. *Dental Cosmos*, March, 1891.

"Two Cases of the Removal of the Gasserian Ganglion." By Dr. Andrews, of Chicago. *Dental Review*, May, 1892.

"Abscess of the Antrum, with Causes and Treatment. By Dr. Wilson, of Burlington. *Dental Review*, 1892.

"Lingual Ulceration of an Epitheliomatous Appearance due to Upper Full Artificial Denture." By Dr. A. C. Hugenschmidt, of Paris. *Dental Review*, March, 1892.

And many others, which will be printed in full with the publication of the report of this section.

The following papers and reports will be presented by the sec tion:

"Pyorrhœa Alveolaris and its Treatment," by Dr. Cravens, c Indiana.

"The Grinding Teeth of the Herbivorous Mammalia," by D A. H. Thompson, of Topeka, Kansas.

"A Report of a New Operation for the Excision of the Inferic Dental Nerve," by Dr. Cryer.

"A Study of the Molar Teeth of the Proboscidium, with Spec mens," by Dr. Barrett, of Buffalo.

Report accepted.

Dr. Cravens then read the following paper:

PYORRHŒA ALVEOLARIS: A CASE IN PRACTICE.

BY JUNIUS E. CRAVENS, D.D.S., INDIANAPOLIS, IND.

The patient, male, aged fifty years, robust, and apparently i good health, but at that time under treatment for affection of nos and throat.

Diagnosis.—Gums generally red and angry-looking, bleedin easily and freely; expressed considerable pus from about the ant rior eight teeth in each jaw, the festoons between which wer swollen, and of a violet color; complained of heat and pricklin pains about the gums around the teeth specified; discovered pus c the approximal faces of roots of the pus-discharging cases; son of the roots were coated with tartar.

July 18.—Removed incrustations from roots in pockets, ar trimmed margins of affected cases as far as practicable; washed ou pockets with hot water, and treated the pockets carefully wit dilute sulphuric acid (one part acid to ten parts water); directe the use of pulverized sulphur as a dentifrice morning and night, ar to avoid the use of soap or other alkalies in the mouth.

July 19.—Gums less congested, otherwise no improvemen washed pockets with hot water, and treated them with dilute su phuric acid.

July 20.—The superior first bicuspid of the right side was free pus; gums looked and felt better; washed with hot water as usua and renewed the treatment with sulphuric acid; advised ice app cations to gums.

July 21.—No change; still some pus from all pockets except s perior first bicuspid on the right side; decided to change treatmen

washed out with hot water, as above, and treated pockets with a ten-per-cent. solution of nitrate of silver. No caustic action observed, and no pain from the lunar-caustic solution.

July 22.—No pus expressed except from between lower centrals and right inferior cuspid, and from between and around the superior cuspid and lateral on the right side, at which points were the deeper pockets originally; washed out pockets, and treated with nitrate of silver as above; gums looking well.

July 25.—Congestion gone, except slight violet tint over roots of inferior centrals, right inferior cuspid, and right superior lateral incisor, and very slight evidence of pus from pockets of the three places named. No pus observed from other points; washed out all pockets and renewed treatment with a ten-per-cent. solution of nitrate of silver.

July 26.—No pus whatever, except minute quantity from one side of right superior lateral incisor; gums so completely free from swelling that I was able to discover and remove a few remnants of calculus; washed with hot water, and treated with solution of nitrate of silver as above.

July 27.—No pus found at any point; gums apparently healthy and patient reported entire comfort; washed out and treated as above.

July 29.—After two days' rest found no pus at all, the pockets evidently filling up by adhesion; washed out with hot water, and treated pockets with the ten-per-cent. solution of nitrate of silver as above.

Note.—The solution of nitrate of silver caused a slight brownish discoloration about the necks of the teeth treated, but exhibited no caustic energy whatever. I think the astringent and antiseptic effects of the remedy were aided and emphasized by the thorough washing out of the pockets at each sitting with hot water. I believe the preliminary use of dilute sulphuric acid aided in removing small particles of calcareous matter from the pockets and stimulated the tendency to granulation there.

This case has an unusual interest for me, in that it appears to be cured, and in an incredibly short time. It will be under my observation for some weeks longer.

DISCUSSION.

Dr. Barrett.—It seems to me that the subject is of too great importance for the paper to be passed over without discussion. If the

subject of pyorrhœa alveolaris, so called, should awaken no thought in the minds of those present, it will show a very small degree of reflection on our part. You will all agree with me when I say that there seems no disease which falls within our province to treat, which calls forth so great a display of knowledge as pyorrhœa alveolaris. The etiology of the disease has never been fully comprehended; it has never, at least, been fully expressed. We have had all sorts of treatment recommended for it, sometimes with good effect, especially in the papers that are read, in the discussions that ensue, and in the statements of different practitioners. Almost invariably they have met with success. We have had recorded comparatively few failures, and yet when we endeavor to follow the same line of practice we have nearly always met with failure. At least, such has been my experience, and such has been the case with most of the men I know. Whether pyorrhœa alveolaris be solely and entirely a local manifestation of a local disturbance, or a constitutional diathesis, has not yet been determined. If there be predisposing constitutional causes, mere local treatment will be useless. If it be a simple local disturbance, if there be nothing beyond the very point of infection, if it be a disease simply of the soft tissues, then local treatment will suffice for all ordinary cases. For myself I am not satisfied with any treatment which I have tried in the past, and I have tried almost everything. I have never yet found that local treatment was sufficient in every case. In some, topical remedies have removed the difficulty, but in the many which I have had I found that mere local remedies have simply palliated the thing for the time being, but have not produced a cure. We want a radical eradication of the disease. Many instances crowd upon my mind at the present moment that I could use as illustrations. I remember cases that have been under my care for year after year. I have been able to hold the disease in subjection partially, but where it was true pyorrhœa alveolaris, in three or six months the patient would return with a new manifestation of the disease, and I found that the whole thing was breaking out again. That has been almost the invariable rule, in cases of that kind which I have attempted to treat. The remedy which is recommended here is cautery; I know of no therapeutic effect which it has except that of cauterization. The success which Dr. Cravens has met with in this case would indicate what? From a knowledge of the remedy and its effects, it would indicate that it was a local manifestation and nothing else. In three months or more will there not be a return of this disease? If it it be a constitutional diathesis, if it

be a local manifestation of a constitutional cause, it will return. Will this be a final cure? Has he simply palliated the evil symptoms, or has he reduced the inflammation without removing the cause of the disease? That is a question which will be exceedingly interesting to have answered in the future. I think he will have a return of that patient with the same manifestations that there were in the first place; I think that with anything of that kind there is not a radical cure, but only a temporary one. I would like to hear the experience of others, whether in such cases as this, from any topical remedies, a cure has been effected, and the case has not returned with exaggerated force and buoyancy.

Dr. Rhein.—Some of the points that the last speaker raised I coincide with very heartily, and some others I do not. After hearing the paper read, it struck me that the case was not a case of pure pyorhœa alveolaris as distinguished from what is commonly understood as false pyorrhœa, or a result of bad hygienic care of the mouth. The one great objection to the description of the case is the lack of attention to the diagnosis at the outset. The writer stated that he believed the patient to be in fairly good health. I believe it almost essential, when a case of this kind presents itself, to settle that question first of all. Is the patient in good health or is he not? We have no right to assume that he is; that is a question that we should settle, and settle it scientifically, and the best way to do so is to give the patient a thorough physical examination, by physical means and by chemical means; the latter through chemical analysis of his urine. Assuming that the doctor's assumption was correct, that he was in fair physical health, I unhesitatingly believe that there was no real disease, as we look on it, and, coming to the question brought out by the last speaker, as to the etiology of pyorrhœa alveolaris, in my mind at the present day that question is pretty firmly established, and I believe it is established in the minds of a great many other practitioners,—to wit, that the disease which we recognize as pyorrhœa alveolaris is unquestionably either the sequence of some constitutional disturbance, or that disturbance is present at the time. That is to say, it is the result of a faulty nutrition of the parts. If that faulty nutrition is caused by some severe constitutional disturbance that cannot be permanently cured, it is very easy for us to determine the fact that the pyorrhœa cannot be cured. If it is an incurable disease, we can give a definite prognosis. If, on the other hand, it is curable, we can give a still more favorable prognosis. This is the point I cared to bring out in the discussion of the last speaker.

The nomenclature is unquestionably a very poor one, because in a strictly literal sense this is not a case of pyorrhœa alveolaris. It is a case of discharge of pus from the alveolar sockets; but we must distinguish it from the common form of a badly-kept mouth, as distinguished from a sequence of a constitutional disturbance, and what I particularly desire to call your attention to is the fact that having determined that (if we cannot do so ourselves, we can by consultation with the physician of the patient ascertain the exact condition of the patient), we can give some definite prognosis as to the result. I know that many cases have passed through my hands that have never been cured, and I have never promised to cure them, because I had found that condition of the system present when I knew the case was hopeless. The patient may have been suffering from tuberculosis, or had some trouble of the kidneys, or there may have been a gouty condition of the system which I have invariably found connected with this disease, and where we find it associated with such a grave condition as to be incurable it is useless for us to give a favorable prognosis.

Dr. Morgan.—My observations have led me to the belief that it is very largely an inherited disease, a local manifestation of a debilitated condition of the system. In a large majority of the cases you will find that entire families are affected more or less with this disease, so that I believe it is a constitutional disease, and if it is to be cured at all, it must be done either by constitutional treatment or by a very radical local treatment. Every case can be cured without a single exception. Just remove the tooth and nature will take care of the balance. I do not know whether I ever cured a case of decided pyorrhœa alveolaris in my life that remained permanently relieved, unless I removed the tooth. I remember an instance of six persons in one family: the children came into my office when they were from eight to fifteen years of age, and until they had passed maturity I preserved their mouths in pretty fair condition, but I treated them every six months. I had an arrangement with the parents by which I could call them to the office and give them treatment, and until they were married their teeth were all preserved intact. The trouble, to my mind, is certainly with the tissues that belong to the teeth; therefore, if you remove the teeth you get rid of the trouble.

Dr. Harlan.—The subject under discussion is the treatment of a single case, and not the etiology of the disease or the multiplicity of remedies. There is no objection to the use of a diluted solution of sulphuric acid around the roots of the teeth as a preliminary

in the beginning of the treatment of such a case, because the diluted sulphuric acid contains about thirteen per cent. of sulphuric acid to eighty-seven per cent. of water, and then you dilute that ten times, so that when it comes in contact with the fluids of the mouth it will do no damage whatever to the tissue of the tooth. It would aid very materially, and in my opinion would act much better than a diluted solution of aromatic sulphuric acid, which is one of the worst remedies for that purpose in the entire materia medica, because it will not dissolve the calcareous deposits that are found on the roots of teeth, and diluted sulphuric acid will.

With reference to a ten-per-cent. solution of nitrate of silver, it is a very good remedy; it has been used in the treatment of conditions of the mucous membrane, but never in so concentrated a stage. What are the effects that should naturally follow the use of a ten-per-cent. solution of nitrate of silver? First, it would be a powerful astringent; secondly, it would act as a stimulant, and the reason for the checking of the pus and the closing up of the pockets in such a short space of time would be due to the properties it possesses. To say a case was cured after eleven days' treatment is something that I could hardly think possible, because if the pockets were of the depth of one-half the length of the root there could not be a reproduction of tissue in that short time with a continual and repeated washing of the pocket. The effect of the use of hot water as a preliminary is excellent, and there is nothing to say against that, because hot water is a very useful agent in many cases and much more beneficial in the vast majority of cases that dentists are called upon to treat than the agents that they do use, because many of them are used unintelligently. Hot water as a therapeutic agent is something that dentists fail to utilize, and so Dr. Cravens has made a very good point in that. I invariably use it, and whenever I desire the effect of a medicinal agent I make use of diluted sulphuric acid, but I dilute it with cinnamon-water or cassia; I think that in that way I perhaps may get a little better effect than from ordinary hydrant-water.

As the question of the treatment of pyorrhœa alveolaris will come up under the head of therapeutics, I just wish to say that I thank Dr. Cravens for his presentation of the subject in this way, because anything that will add to our resources in the treatment of disease of this kind is very valuable. It is undoubtedly much more local than some of the gentlemen think; for, as Dr. Morgan has stated, whenever you extract the tooth, the case gets well. No one ever saw a case where the teeth were extracted that the case did

not get well. There is a strong probability that it is a purely loca disease, with many constitutional manifestations, most of them con comitant and not the cause.

Dr. Cravens.—I have very little to say in closing the subject. I think Dr. Barrett misunderstood me in regard to the caustic effect of the nitrate of silver solution. I stated in the paper distinctly that I could observe no caustic effect at all. I cannot agree with Dr. Rhein in regard to the constitutional character of the affection, or that it is complicated always with constitutional affections. Dr. Thomas W. Evans, of Paris, told me that he had seen so many cases associated with affections of the kidneys that he believed it would very likely come to be recognized as a manifestation of kidney trouble. He also told me that in that country many dentists regarded it as a form of gout.

In regard to the analysis of the urine, I do not believe the dentist can always do that. I have not the facilities, and I doubt very much if I have the ability. I would not do it if I had both. In regard to whether the case was cured or not, I simply expressed the opinion that I thought it was. I hope I will have the pleasure of hearing more about the case later on from some of the Nashville dentists who are here to-day, as the patient was a Nashville gentleman.

I want to thank Dr. Harlan for the encouraging remarks he made.

(To be continued.)

Editorial.

HONOR THOSE WHO DESERVE IT.

Original thought is perhaps the rarest of gifts, and the idea has been entertained that nothing in our modern life can be stamped with that quality, all forms being but changes upon the work of past generations of civilization. This is, probably, in its broadest sense true, yet there is unquestionably absolute originality, or else there could be no progress. It is possible that the art of to-day may be a lost art recovered and moulded to suit the ideas of our more advanced life, but it still remains original with this period,

and can in no sense be regarded as a legacy in whole from the past.

Who can estimate the amount of loss of original discoveries in the arts and sciences? Who will ever know the number who have died and carried the secret of some valuable addition to the knowledge of the world with them? The answer to these questions can never be given, but every single loss means sooner or later the necessity for a repetition of the same work by others and rediscoveries along all lost lines of work. The world's needs will compel this.

A very singular fact, and one worthy of more attention than is usually given it, is that it is exceedingly rare to find any discovery made by a single individual. The germs of invention will secure a lodgement in several receptive brains at the same period, and the work will proceed independently to one common end. The records of the Patent-Office are full of such cases. What is true of the mechanical side of active life is equally true of problems of thought. To defend originality here is more difficult, and the plagiarist can revert with some degree of plausibility to the assumed fact that all the ideas of to-day are but restatements of those of yesterday, and, therefore, have no rightful owner.

The question, Who can claim originality? has vital importance in all the various relations of active life, but to none more than dentistry.

While the evolution of mentality has had its proportion of loss and gain, and while in the general advance the individual has suffered, it does not follow that this need be continued indefinitely. It is just as important to our conception to historically preserve the originator as the thing originated, yet civilization clings to the latter and forgets the former.

Dentistry can scarcely be said to have a history. Whatever of value it possesses as one of the very important branches of work has accrued in a comparative short term of years, and yet brief as is the largest proportion of originators are already lost to knowledge.

We have urged the importance of this branch of our subject in a previous article, but the negligence, amounting almost to criminality, still continues with accumulating force, threatening to deprive men not only of the right of invention, but after having freely given their ideas to the profession to have them as freely stolen.

It is time we honored those who deserve honor, and preserve the record for the instruction and emulation of future epochs.

The question naturally follows, To whom should be given honor, the man who scientifically demonstrates a fact and then boldly promulgates it, or he who has discovered the germ and permits it to die? These two classes abound everywhere, and the latter is extremely prolific in dentistry. This is to be expected. The two or three who receive the inspiration of an invention are multiplied to an increasing number from the fact that the incentive to inspiration, necessity, is, and always has been, present here to a greater degree than elsewhere.

There probably never has been an association or convention of dentists where an elaborate scientific statement has been made but that some one would claim precedence of discovery. So common has this been that it has ceased to excite remark. This is wrong, as in our judgment it should be met by a proper investigation and the truth established. For this purpose each society might have a standing committee to whom all such questions should be referred. It must be remembered we are making history, and it is of vital importance that the origin of all things should be established now, and not be left to the uncertainties of a future period.

The two classes of workers before referred to, the one who has scientifically elaborated a subject and given it freely to his colleagues, and the other who has discovered a fact and permitted it to die, have each a place worthy of honorable mention; but he whose work has been based on scientific principles, who has exhausted all available means and in the end has accomplished results, is entitled to the honor of original discovery, and his name should accompany it to remotest generations. On the other hand, the man who has kept his work secret, perhaps not extending it to important conclusions, or not following scientific methods, or, if successful, lacking moral courage to let the world know of his results, has no right of discovery. More than this, he is to be condemned, in that by his want of professional energy or cowardice, or both combined, the profession has been deprived of a valuable accessory to practice.

The truth of these statements has found renewed confirmation recently in two meetings of the profession, one at Niagara Falls, the American Dental Association, and the other at the New York Odontological Society, and both on the same subject,—"The Use of Nitrate of Silver in Dental Caries." At the first the claim was made that this agent had been used forty years ago for a similar purpose. If this be true, and we have no reason to doubt the statement, the literature of the period failed, as far as we are aware, to

show it. If any dentist did the work as claimed, how much may not have been lost by the neglect to press the matter upon the profession! When Dr. Stebbins, of Massachusetts, presented this subject after six years of patient investigation, it was regarded as entirely new in the direction in which he had experimented. His work had been thoroughly done, and, having accomplished substantial results, he gave these and the process, leaving it to others to confirm them. In view of these facts, does the credit of this belong to the dead past or the living present?

The remarks of Dr. Brockway in the discussion of this subject before the New York Odontological Society illustrated so admirably a rare class of mind, one with the courage to admit an error, that we cannot omit reproducing them here: "I have been in the habit of using nitrate of silver myself occasionally for many years. I am quite ashamed to mention this fact, inasmuch as I did not have courage enough or did not use it understandingly enough to go on and secure decided results, but I have for the past twenty-five years occasionally touched softened spots, especially on the buccal surfaces of molar teeth, with nitrate of silver with the hope of retarding decay. I have done it almost empirically, and with good results."

Whether Dr. Stebbins's results will be verified or not remains for time to demonstrate; but one thing has been clearly proven,—the necessity of thoroughly doing the work allotted to any one to do, and having left nothing undone to test conclusions, then giving them to the world regardless of consequences.

The profession, then, has its duty, and that is not to permit the discoverer to be buried in oblivion or his labor to be appropriated by others. His reputation is in the hands of his colleagues. He has freely given his work, let them see to it that it is honestly defended.

The time has come for plain words and men with the courage of their convictions.

THE RELATION OF DENTISTRY TO MEDICINE.

For a long time it has been a question of great interest whether dentistry is an independent profession, or whether it is a legitimate branch of medicine.

In times past many dental practitioners warmly declared that they were not specialists in medicine, because the medical conventions refused to recognize them as such. Some even declared that they would not be medical specialists if they could, as though individual preferences could make any difference in the relationship under discussion.

The wood-workers on a modern war-ship might refuse to recognize the iron-workers as ship-builders, but would clannish jealousy change the fact that they are all ship-builders?

From a general point of view, it might be said that, since the science of medicine embraces all pursuits which eliminate disease from the human body, dentistry must take a place as one of its legitimate branches.

But this statement might be considered a mere quibble, if it were not known that dentistry and general medicine must be intimately dependent upon each other if the best results are to be obtained.

On the welfare of the teeth depend a healthy digestion, and all pertaining thereto. A dental abscess or an aching nerve may profoundly disturb the nose, eye, ear, or throat. Anæmia and childbirth react seriously upon the health of the teeth; and the list might be almost indefinitely extended.

But perhaps some one may say, "Is not the origin of medicine and dentistry different? Did not dentistry spring from a race of fakirs and barbers, while medicine, from time immemorial, has been a profession of respectability and learning?

If this were so, would separate origins prove diverse professions? The Mississippi and the Missouri rise from different regions, but when they join does the diversity of their sources prevent them from forming a homogeneous, all-conquering stream?

Because barbers cupped, bled, and leeched, does that fact make those necessary operations any less professional or dignified in the eyes of the medical practitioner? Why, then, should the fact that barbers pulled teeth be so often quoted as a proof of dentistry's low origin? From this stand-point the barber would pose as an absolute connecting-link between general medicine and dentistry. But such an honor can hardly be accorded him.

From earliest days the care of the teeth has been an important part of medical education. In proof of this it might be well to quote a few lines from E. S. Talbot's opening address before the Section of Oral Surgery of the American Medical Association, June, 1891:

"Hippocrates speaks of dentifrices and fixing of teeth. Celsus, at the end of the first century, Ætius, in the sixth, Egenolff and Ambrose Paré in the fourteenth, all mention certain forms of treatment of the teeth. John Hunter, 1728, spent much time and study in dental treatment, as well as in the study of general anatomy. Fouchard, 1747, Bourdet, 1786, practised dentistry and wrote extensively on dental subjects. The instruments for dental as well as surgical purposes which are to be seen in the museums of Europe, together with the beautiful specimens of Etruscan and Phœnician dentistry now in possession of Drs. Van Marter of Rome, Barrett of Buffalo, and Taft of Cincinnati, are striking illustrations of the superior ability which men in early times acquired."

The last barrier was thrown down when dentistry was recognized by the American Medical Association as a branch of medicine. Each dentist is now tendered the inestimable advantage of personal contact with the medical profession at large. But does this mean that the schools of dentistry, as now organized, are to become obsolete, and that in time dentistry will be studied in medical colleges? Such an evolution is most improbable.

In reviewing the history of dentistry, it is noticeable that the men who have done the most to advance her interests have been without the title of M.D. This seems at first most remarkable, as the knowledge of general medicine is an unquestioned advantage; but, nevertheless, remarkable as this may appear, statistics prove it to be a fact.

The prominent men within the last fifty years who hold the simple title of D.D.S. first had their hands and eyes trained to perform the work of dentistry. For this reason, in later life, each medical fact was regarded from a dental point of view, and eagerly appropriated and modified to suit his operations. But the medical man with a dental education who has first had his interest aroused in all the specialties of medicine is apt to allow his attention to be diverted into three or four channels, and thus lacks the concentration and devotion which can alone bring success in a profession. A general practitioner who has dental training can hardly be expected to successfully compete with a dentist who has medical training; therefore, the independent college of dentistry, as it now stands, would seem an absolute necessity. The eye and hand must be trained long and carefully to perform their delicate work; the structures of the teeth must be impressed prominently on the student's mind, the artistic knowledge of facial restoration must be inculcated, and then let there be introduced into the course as much

general medicine as may be expedient, but, so far as possible, let it be regarded from a dental stand-point. In a medical college such a course would not be feasible.

In closing, it may be said that while dentistry is a branch of medicine, it is such an extensive and important branch that its course of instruction must, of necessity, so differ from general medicine as to make them seem like separate professions.

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CORRECTION.

The date on the thirteenth line from the bottom on page 651 of Dr. Sudduth's article in the last number (September) should read 1889–90 instead of 1890–91.

Bibliography.

Five Hundred and Sixty-seven Useful Hints for the Busy Dentist. By William H. Steele, D.D.S. Published by the Wilmington Dental Manufacturing Company, Philadelphia, 1892.

The compilation of such a book as this means care and labor of no ordinary amount. The author gives as the reason for his effort in this direction that "for many years I have felt the need of a little hand-book such as I have attempted. . . . My intention has been to furnish an answer as accurately and with sufficient detail, in as compact and accessible a form as possible, to all questions and difficulties that may arise in our every-day life, at the chair or bench."

The book is divided into five departments,—A, B, C, D, E. Department A is devoted to hints in operating; B, to mechanical work; C, to crown- and bridge-work; D, to a variety of useful suggestions in many departments of dental work; E, to a miscellaneous collection of hints of more or less value to the practical man.

For the service this book is intended to perform it is well prepared, and will, no doubt, be of great value to the beginner in practice, but to those thoroughly educated a collection of this kind

should not be needed. The trained dentist ought to have all the minor points of every-day practice thoroughly absorbed and capable of being brought into use at a moment's notice. This class, it may be feared, is not a large one, hence a book of this kind will have a special value to a certain proportion of men who will always require a constant stimulus to memory.

THE MEDICAL AND DENTAL REGISTER, DIRECTORY, AND INTELLIGENCER OF PENNSYLVANIA, NEW JERSEY, AND DELAWARE. George Kiel, publisher: Philadelphia, 1892.

This book contains a complete list of the National and State Medical and Dental Associations, with their officers and date of meetings, Medical and Dental Colleges of the United States, and other very valuable material, Medical and Dental Laws, Hospitals, Homes, etc., etc., also the lists of Medical and Dental practitioners, with their school and year of graduation, post-office addresses, and office hours.

Directories, to be of any value, must be carefully compiled. This seems to be arranged with a conscientious effort in this direction. Mistakes in names and residences are perhaps unavoidable, but this, as far as we are able to determine, is exceptionally free from these. From the comparatively limited area of country covered, this is to be expected.

The additional matter connected with it makes it extremely valuable for reference in the special field for which it was designed.

Obituary.

DR. O. F. HARRIS.

WHEREAS, The hand of Divine Providence having removed from our midst Dr. O. F. Harris, of Worcester, after a life of usefulness and honor, we place upon our records our appreciation of his wisdom and skill.

Resolved, That we tender to his family our sincere condolence and sympathy.

(Signed) D. B. INGALLS,
S. G. STEVENS,
J. W. BAILEY,
Committee.

(Attest) EDGAR O. KINSMAN,
Secretary.

DR. HORATIO LESEUR.

Your committee appointed to prepare resolutions of respect to the memory of the late Dr. Horatio Leseur, of Boston, present the following:

Resolved, That we spread upon the records of this Society our appreciation of his long service and uniform genial disposition. Passing from active life at a mature age, he leaves upon the memory of those with whom he has been associated an incentive to be helpful to all around them.

Resolved, That this Society tender his family its sincere sympathy in this bereavement.

(Signed) D. B. Ingalls,
S. G. Stevens,
J. W. Bailey,
Committee.

(Attest) Edgar O. Kinsman,
Secretary.

Foreign Correspondence.

CORRESPONDENCE AND REPLY OF DR. W. MITCHELL.

[The annexed correspondence will explain the reason why no answer has heretofore appeared to the criticism in *The Journal of the British Dental Association* on Dr. Mitchell's paper, published in the January number of this journal. The reasons given for the rejection of the reply are peculiar in view of the character and prolixity of the letters admitted to the pages of the journal named.—Ed.]

11 Queen Anne Street, Cavendish Square,
London, W., August 29, 1892.

W. Mitchell, Esq.:

Dear Sir,—At the request of the Publishing Committee of *The Journal of the British Dental Association* I am writing to say that they have fully considered your letter, and regret that under the present and constantly-recurring pressure of matter for the *Journal* they do not see their way to reopen a discussion upon the subject started by you, and which was practically closed by the replies

inserted in the March number of the *Journal*, and they do not think that any good can accrue by again bringing the question forward.

They therefore regret their inability to insert your letter, which I beg to return.

Yours faithfully,

J. F. COLYER,
Sub-Editor.

39 UPPER BROOK STREET, LONDON, W.,
August 30, 1892.

J. F. COLYER, ESQ.:

DEAR SIR,—I must thank you for your kindly-written letter, for your Publishing Committee placed you in a very awkward position by their illogical action: 1st, by the delay in acting upon my paper as compared with the extreme haste with which the letters of my alleged critics were inserted; 2d, by refusing to give me barely one and one-fourth pages of *The Journal of the British Dental Association* when my would-be critics are allowed five pages; 3d, by refusing me the ordinary amenities of discussion in debarring me from closing that subject, an invariable rule at any organization where papers are read and subjects discussed pertaining thereto, thereby stamping as only traditional that much-vaunted virtue, "English fair play." You will please convey my regrets to the committee that their action was not based upon tangible grounds.

Hoping I have not intruded too much upon your valuable time, and again thanking you for your kind diplomacy in negotiating the onerous position your committee placed you in,

I remain, yours very truly,

W. MITCHELL.

TO THE EDITOR OF THE JOURNAL OF THE BRITISH DENTAL ASSOCIATION:

SIR,—A short time ago there appeared in your journal what purported to be criticisms upon a paragraph from a paper read by me at a dental meeting at Heidelberg. Had the paper been quoted *in extenso* instead of arbitrarily it would have furnished its own reply. But as the truth of my statements have been questioned, I must, in fair play, ask your indulgence in allowing me to verify them through your journal. With the personalities indulged in I have nothing to say, except I have yet to learn that they are an equivalent for argument, or that vituperation can take the place of logic. The anonymous side of the correspondence I cannot notice at all.

I am prepared to stand by and defend my paper as written and read before a European meeting, upon, in many respects, an essentially European subject, and can only conclude, by the vigorous manner in which it was assailed by your correspondents, as to its applicability. Apparently the greatest offence I committed in my paper was the question, "Why is it that the best and most progressive students, after completing their course on this side and having learned all their instructors were capable of imparting to them here, seek the halls of learning in America to secure that which they were unable to obtain here, where the best obtainable is supposed to be within easy reach?" As your correspondents have elected to so modify geography as to kindly consider England as constituting Europe, I can only add that, if the "best" do not go to the United States for advanced dental instruction, the most "progressive" *do.*

And for the benefit of those who would doubt the foregoing statement, the following data may furnish food for reflection.

From 1881 to 1891 there were in attendance at six representative dental colleges in the United States ninety-seven students from Great Britain, one hundred and seventy from British colonies, and three hundred and forty-two from continental Europe. In passing, would say, as five of your correspondents are connected with dental institutions, it would be interesting to know how many foreign students have entered the English dental schools during a like period.

In the face of the foregoing figures it will not do to say all these are deficient in capacity, and only represent the fringe of the profession, or that they went to the States because it was cheaper or more easy of access, or the requirements more superficial. The only logical deduction possible is that most of them went on popular judgment, or at the instigation of their preceptors, who, from definite knowledge, knew where that which was of the most importance to both dentist and public was obtainable,—viz., thorough practical knowledge.

That the foregoing is not an imaginative statement can be proven beyond the possibility of a doubt by reference to our literature as to the advancement made in conservative dentistry by the profession in America, the spirit of which is reflected in the teaching of the institutions of that country, to the advancement of our profession wherever dentistry is known. This is most substantially endorsed by ex-presidents of the Odontological Society and branches of the British Dental Association by sending their sons to the very

institutions your correspondents would denounce, thus more effectually refuting than I could the bulk of the latter's arguments.

A reference by one of your correspondents having been made to the post-graduate courses held here a few years ago, a word or two in passing might not be out of place. These valuable adjuncts to dental practitioners have been a feature of American schools for the past fifteen years. Having attended a post-graduate course here, one thing that strongly impressed me was, that of the six lecturers at that school, three were graduates of American colleges, another had received his instruction at the hands of his father, who was an American dentist, and as no allusion whatever was made to the American system of dentistry, vol. ii. pages 831 and following, by one of the other lecturers whose text and illustrations were similar, I can only conclude in this case it is but another proof of the coincidence of action that occasionally occurs only in the case of truly great minds. I might add that at the same institution the chair of operative dentistry has been held for nearly, or quite, the past fifteen years by graduates of American colleges, and positions have been offered to at least two others. In another post-graduate course, held about the same time, we see in a leading journal that a demonstrator of the electric mallet "actually filled a crown cavity before the class." It has also come under my notice at dental meetings recently to hear metal crowns spoken of as "a passing fancy," and "a show of hands asked for from those who considered crown-work a legitimate operation." Such examples as these, coming as they do from high places, probably to quite an extent, furnishes a reply to my query at the opening of this communication.

I must, in the face of these facts, maintain that it is to the enterprise and capacity of American colleges, through their instructors and their noble ally, the press of that country, that the coming dentists must continue to look for the highest and most advanced ideals of conservative dental attainments.

Apologizing for intruding so much upon your valuable space,

I beg to remain, yours respectfully,

W. Mitchell.

Since writing the foregoing, a more potent argument, if possible, than any of the preceding has presented itself for the demolition of the statements of more than one of my supposed critics, and that is the winning of the Saunders prize by a man who had taken the degree of D.D.S., thereby proving the wisdom of his selection

in taking the D.D.S. *first.* The Saunders scholarship is the highest prize at the disposal of the London Dental Hospital, and I see by Mr. Morton Smale's speech (see August number *Dental Record*, page 351), "some changes had been made in the method of deciding the award of the Saunders scholarship with a view to insure its being obtained by the best all-round man," thus clearly disposing of the statement that "the best students do not go to America," etc.

It may only be coincidental, yet for that reason may be worthy of mention, that the first report we have of crown-work being done at the London Dental Hospital was concurrent with the entrance of the aforesaid pupil to that institution (see *British Journal of Dental Science*, March 15, 1892, page 286).

W. M.

Current News.

THE WORLD'S CONGRESS AUXILIARY OF THE WORLD'S COLUMBIAN EXPOSITION.

CHARLES C. BONNEY, *President.* LYMAN J. GAGE, *Treasurer.*
THOMAS B. BRYAN, *Vice-President.* BENJ. BUTTERWORTH, *Secretary.*

DEPARTMENT OF MEDICINE.

GENERAL DIVISION OF DENTAL AND ORAL SURGERY.

Preliminary Address of the Committee on a Dental Congress.

It is the aim of the World's Columbian Exposition to gather together the evidences of the material progress and achievement of the civilization of the world, and so arrange them that every department of human endeavor may be studied and examined through all its various grades of development.

It is also their desire to represent the intellectual and scientific development and achievement of the entire civilized world by a series of great Congresses, to be held during the progress of the Exposition.

In pursuance of this object the World's Congress Auxiliary was organized by the World's Columbian Exposition, and it has re-

ceived the recognition and support of the government of the United States.

It is the plan of the World's Congress Auxiliary to bring into communication, through these Congresses, the best thinkers and workers in every department of knowledge, including Religion, Science, Philosophy, Literature, Art, Agriculture, Trade, Labor, etc., and by the presentation and interchange of ideas, methods, theories, and practical experiences to promote the advancement of all that is noblest and best of our present civilization.

Committees have therefore been appointed to organize a series of Congresses, representing nearly every field of thought, and of speculative and practical endeavor.

In the field of professional achievement, Medicine and Surgery, in their various special applications, will form a very large and interesting feature of the work of the World's Congress Auxiliary.

Dentistry is an important department of Medical Science, and an outgrowth of our modern civilization. Its present perfection is in considerable degree due to the thought and labor of American minds.

The history of modern dentistry is covered by a period of less than two generations, and yet it has advanced from the rude operations practised by the blacksmiths and barbers to one of the most scientific and exact of the specialties of the healing art.

Scientific Dentistry had its birth in the United States of America. This country has the proud distinction of having organized the first school for the teaching of dental science, and the establishment of the first periodical journal devoted to the interests of dentistry, while very many of the most useful appliances and scientific methods have originated on this side of the Atlantic.

It is therefore eminently fitting that Dentistry be represented at the World's Columbian Exposition by a display of the progress which has been made in the development of its materials, instruments, appliances, processes, and methods of a practical nature, and in scientific research, literature, and professional education.

With this end in view the dentists of the United States took steps in August, 1890, to organize such a World's Congress, by the appointment of a General Executive Committee, to whom the whole matter of organizing and conducting the Congress was referred.

The work therefore of the Committee on Dental Congresses, appointed by the World's Congress Auxiliary, will be chiefly in

co-operation with that General Executive Committee, in publishing to the world from time to time the progress of the work of organization, in promoting the interests of the Congress in every way within their power, and keeping it in harmony with the general plans of the World's Congress Auxiliary.

Every effort will be made to secure the best talent in the presentation of scientific subjects, and in practical demonstrations.

The World's Columbian Exposition, through its Directory, will provide ample accommodations for all the various World's Congresses to be held in Chicago in 1893. The Memorial Art Palace, now in process of erection upon the shore of Lake Michigan, and located near the centre of the city, will be devoted to this purpose. This building will contain two large audience-rooms, with a seating capacity of about three thousand each, which will be used for the general Congresses of the various departments, besides numerous smaller rooms, suitable for the Chapters and Sections of the Congresses, thus affording for the Dental Congress ample accommodations for clinical demonstrations of a suitable nature.

During the sessions of the Dental Congress several popular evening meetings will be held, to which the general public will be invited. At these meetings, which are intended to be educational, illustrated lectures will be delivered by some of the most eminent men of the profession upon topics which are deemed to be of vital importance to the public. These meetings will be especially under the control and management of the World's Congress Auxiliary. When the suggestions of the Advisory Councillors of the Dental Congress shall have been received as to the most interesting and vital questions to be presented, a programme will be arranged for publication.

A cordial invitation is extended to the dentists of the world to take part in the scientific work of the Congress by the presentation of papers and discussions or demonstrations of new or improved methods and appliances.

America, and Chicago in particular, will have a hearty welcome for all who may come.

An earnest effort was made to bring the meeting of this Congress in close connection with others of the Department of Medicine, but that effort having proved unavailing, arrangements have been effected under which the meeting of the dental profession will be held on or near August 17, and is expected to continue during the week or ten days following. Definite dates and details will be given in the programme.

Communications in reference to the special work of the Congress should be addressed to Dr. A. O. Hunt, Secretary World's Columbian Dental Congress, Iowa City, Iowa, U.S.A.

Communications in reference to the general work of the World's Congress Auxiliary and suggestions from the Advisory Councillors may be addressed to the Chairman of the Committee.

Dr. John S. Marshall, *Chairman*,
No. 34 Washington Street, Chicago.

Dr. A. W. Harlan, *Vice-Chairman.*

Dr. G. V. Black, Dr. C. N. Johnson, Dr. George H. Cushing,
Dr. N. Nelson, Dr. A. E. Baldwin, Dr. A. W. Freeman,
Dr. E. S. Talbot, Dr. George A. Christman,

Committee of the World's Congress Auxiliary on a Dental Congress.

THE WOMAN'S COMMITTEE OF THE WORLD'S CONGRESS AUXILIARY ON A DENTAL CONGRESS.

Dr. Hattie E. Lawrence, *Chairman.*
Dr. Marie T. Bacon, *Vice-Chairman.*

Dr. Emma Beanham, Dr. Louise Peterson, Dr. Rebecca McIntosh.

World's Congress Head-quarters, Chicago, June, 1892.

PARTIAL LIST OF THE ADVISORY COUNCIL OF THE WORLD'S CONGRESS AUXILIARY ON A DENTAL CONGRESS.

Dr. W. D. Miller, Berlin, Germany; Dr. F. Busch, Berlin, Germany; Dr. Thos. W. Evans, Paris, France; Dr. E. Magitot, Paris, France; Dr. G. W. Sparrock, Lima, Peru; Dr. W. B. Macleod, Edinburgh; Dr. A. W. W. Baker, Dublin; Dr. Ernst Sjoberg, Stockholm, Sweden; Dr. Charles S. Tomes, London, England; Dr. W. H. Coffin, London, England; Dr. W. Geo. Beers, Montreal, Canada; Dr. H. C. Edwards, Madrid, Spain; Dr. E. Lecaudy, Paris, France; Dr. —— Plattschick, Pavia, Italy; Dr. Joseph Arkövy, Buda-Pesth, Hungary; Dr. C. Redard, Geneva, Switzerland; Dr. J. G. Van Marter, Rome, Italy; Dr. W. H. Morgan, Nashville, Tenn.; Dr. W. H. Dwinelle, New York City; Dr. R. B. Winder, Baltimore, Md.; Dr. Elisha G. Tucker, Boston, Mass.; Dr. W. W. H. Thackston, Farmville, Pa.; Dr. J. B. Rich, Washington, D. C.; Dr. J. D. White, Philadelphia, Pa.; Dr. W. H. Eames, St. Louis, Mo.; Dr. J. B. Patrick, Charleston, S. C.; Dr. C. C. Knowles, San Francisco, Cal.; Dr. F. J. S. Gorgas, Baltimore, Md.; Dr. G. V. Black, Jacksonville, Ill.; Dr. J. E. Garretson, Philadelphia, Pa.; Dr. R. Finlay Hunt, Washington, D. C.; Dr. E. Bacon, Portland, Me.; Dr. Benjamin

Lord, New York City; Dr. A. L. Northrop, New York City; Dr. W. W. Allport, Chicago, Ill.; Dr. W. W. Walker, New York City; Dr. L. D. Carpenter, Atlanta, Ga.; Dr. J. Y. Crawford, Nashville, Tenn.; Dr. W. J. Barton, Paris, Texas; Dr. J. Taft, Cincinnati, Ohio; Dr. C. S. Stockton, Newark, N. J.; Dr. L. D. Shepard, Boston, Mass.; Dr. H. J. McKellops, St. Louis, Mo.; Dr. A. O. Hunt, Iowa City, Iowa; Dr. H. B. Noble, Washington, D. C.; Dr. Geo. W. McElhaney, Columbus, Ga.; Dr. J. C. Storey, Dallas, Texas; Dr. M. W. Foster, Baltimore, Md.; Dr. A. W. Harlan, Chicago, Ill.; Dr. J. S. Marshall, Chicago, Ill.

PARTIAL LIST OF THE WOMAN'S ADVISORY COUNCIL ON A DENTAL CONGRESS.

Dr. Lucy Hobbs Taylor, Lawrence, Kansas; Dr. Olga Neymann, New York City; Dr. Jessie Ritchie, Des Moines, Iowa; Dr. Annie D. Ramborger, Philadelphia, Pa.; Dr. Jennie Hilton, Fort Atkinson, Wis.; Dr. Clara W. McNaughton, Washington, D. C.; Dr. Kate C. Moody, Mendota, Ill.; Dr. Martha J. Robinson, Cleveland, Ohio; Dr. Annie F. Reynolds, Boston, Mass.; Dr. Mary T. Benfield, Honolulu, Hawaii; Dr. Marie Holst, Aarhuus, Denmark; Dr. Henriette Tiburtius-Hirschfeld, Berlin, Germany; Dr. Helene Wongl v. Swiderska, St. Petersburg, Russia; Dr. Bella Meller, Vienna, Austria; Dr. Helene Freudenheim, Königsberg, Germany; Dr. Marie M. Schneeyans, Elberfeld, Germany; Dr. Emma Lacey, London, England; Dr. Clotilde Lenta, Rome, Italy.

MISSOURI STATE DENTAL ASSOCIATION.

The Twenty-seventh Annual Meeting of the Missouri State Dental Association was held at Clinton, Mo., July 5 to 8, inclusive. There were twenty-six new members admitted, and eleven papers read.

The following is the list of officers and committees elected for the ensuing year:

President, J. D. Patterson, Kansas City; First Vice-President, W. E. Tucker, Springfield; Second Vice-President, DeCoursey Lindsley, St. Louis; Corresponding Secretary, William Conrad, St. Louis; Recording Secretary, H. A. Rubey, Clinton; Treasurer, Jas. A. Price, Weston.

Executive Committee.—C. B. Hewitt, Kansas City; A. J. McDonald, Kansas City; J. E. Crozier, Lees Summit.

Board of Censors.—E. E. Shattuck, Kansas City; H. A. Cress, Warrensburg; E. B. Crane, California.

Committee on Ethics.—Frank Slater, Rich Hill; J. B. Newby, St. Louis; C. L. Hungerford, Kansas City.

Committee on Law.—Jas. A. Price, Weston.

Committee on Publication.—J. E. Crozier, Lees Summit; T. J. Frey, Moberly; C. L. Hickman, St. Louis.

Committee on New Appliances.—C. L. Hungerford, Kansas City.

Supervisor of Clinics, C. H. Darby, St. Joseph.

The next meeting of the Association will be held at Excelsior Springs, Mo., on the first Tuesday after July 4, 1893.

WILLIAM CONRAD,
Corresponding Secretary.

ST. LOUIS, MO.

RECENT PATENTS.

A LIST of recent patents, reported specially for the INTERNATIONAL DENTAL JOURNAL.

479,407.—Dental Syringe. John M. Drennan, New York, N. Y. assignor to the S. S. White Dental Manufacturing Company, Philadelphia, Pa. Filed June 2, 1892.

480,121.—Dental Disk-Carrier. Mathew S. Nichols, Central Village, Conn. Filed June 25, 1891.

480,261.—Dental Cabinet. Christian A. Herr, Osborn, Ohio. Filed August 24, 1891.

480,357.—Dental Jaw-Brace. Arthur E. Worthen, Melrose, Mass., assignor of one-half to Charles L. Sprague, same place. Filed April 12, 1892.

480,471.—Dental Moistening-Pad. George W. Melotte, Ithaca, N. Y. Filed April 30, 1892.

480,678.—Dental Engine. Charles W. Thomas, Jersey City, N. J., assignor of five-sixths to Philip Van Volkenburgh, New York, and John H. Pendleton, Brooklyn, N. Y. Filed October 21, 1890.

Designs. 21,771. Dental Punch. Charles E. Blake, Sr., San Francisco, Cal. Filed June 27, 1892. Term of patent fourteen years.

CONNECTICUT VALLEY DENTAL SOCIETY.

At the Twenty-eighth Annual Meeting of the Connecticut Valley Dental Society, held at Greenfield, Mass., June 1, 2, and 3, the following officers were elected for the ensuing year:

President, Dr. F. W. Williams, Greenfield, Mass.; Vice-Presidents, Dr. W. H. Rider, Danbury, Conn., Dr. W. O. Barrett, Ware, Mass.; Secretary, Dr. Geo. A. Maxfield, Holyoke, Mass.; Assistant Secretary, Dr. A. J. Cutting, Southington, Conn.; Treasurer, Dr. F. R. Rice, North Adams, Mass.

Geo. A. Maxfield, D.D.S.,
Secretary.

AMERICAN ACADEMY OF DENTAL SCIENCE.

The Twenty-fifth Annual Meeting of the American Academy of Dental Science will be held in Boston on Wednesday, November 16, 1892. The Annual Address will be delivered by Dr. A. W. Harlan, of Chicago. As this will be the Twenty-fifth Anniversary of the Academy, a full attendance of members (active, associate, and honorary) is particularly requested.

E. N. Harris,
Corresponding Secretary.

248 Boylston Street, Boston.

OFFICERS OF THE MASSACHUSETTS DENTAL SOCIETY, 1892–93.

President, J. W. Ball, D.D.S., Boston; Vice-Presidents, W. E. Page, D.M.D., Boston, and Jos. King Knight, D.D.S., Hyde Park; Secretary, Edgar O. Kinsman, D.D.S., Cambridge; Treasurer, Edward Page, M.D., D.M.D., Charlestown; Librarian, Jos. King Knight, D.D.S., Hyde Park.

Executive Committee.—Geo. F. Eames, M.D., D.D.S., Boston; W. E. Boardman, D.M.D., Boston; H. S. Draper, D.D.S., Boston; J. H. Daly, D.D.S., Boston; T. W. Clements, D.D.S., Brookline.

Edgar O. Kinsman,
Secretary.

NEW ENGLAND DENTAL SOCIETY.

CAMBRIDGE, MASS., September 17, 1892.

THE Thirtieth Annual Meeting will be held in the lecture-room of the Natural History Society Building, corner of Berkeley and Boylston Streets, Boston, Mass., Thursday, October 6, and at the Boston Dental College, Friday, October 7. Programmes will be sent later. A good meeting is promised by the Executive Committee. Mark off the time on your appointment-books *now*, and endeavor to attend.

EDGAR O. KINSMAN, D.D.S.,
Secretary.

Selections.

EUROPHEN IN MINOR SURGERY.

THE results obtained by me from the use of europhen have been most satisfactory, and lead me to add my indorsement of its use as a substitute for iodoform.

In the case of a driver of a beer-wagon, the index and middle fingers of the right hand had been severely crushed by being caught between two barrels. There was a fracture of the middle phalanx of the index finger, with several deep, lacerated wounds of both fingers. Several days before coming to me the patient had applied a carbolic-acid solution to the fingers, which had become of a greenish-black color. The fingers and hand were intensely swollen; there was pain in the elbow, and a dark, foul-smelling pus exuded from the wounds. The treatment was by thorough washing of the injured parts in bichloride solution, insufflation of europhen into the wounds, and envelopment of the fingers in a one-to-eight ointment of europhen and lanolin. Five days therefrom the swelling of the fingers had become reduced and there was less pus secretion from the wounds. The skin was still black and easily detached from the fingers in several places. A dark pus covered the denuded surfaces. As much of the cuticle as could be separated was removed, and europhen was dusted upon the denuded surfaces, as also into the wounds. This treatment was continued, and in about eighteen days the wounds were entirely closed, the

cuticle having been freely and completely separated two days previously.

A child, four years old, was suffering from a large cervical abscess. It was opened and a large quantity of pus evacuated. The abscess cavity was curetted and europhen insufflated. The child was seen several days thereafter. Recovery was uninterrupted.

A child, aged three years, had had its buttocks and left lower extremity severely scalded by falling into a pot of boiling water. Carron oil was applied for forty-eight hours, followed by the dusting of europhen over the buttocks and half of the thigh. Boric acid and bismuth were used on the rest of the thigh and on the leg. As no deleterious results followed the application of europhen, its use was adopted upon the whole of the scalded surface. Recovery was complete with no untoward symptoms.

In several other minor cases I have used europhen, and in no case have poisonous results followed its application. Europhen is undoubtedly as effective as iodoform. It is lighter in weight, does not cake, and is more readily dusted or insufflated. It is innocuous and free from disagreeable odor.

P. G. Becker, M.D.

—*New York Medical Journal.*

THE

International Dental Journal.

VOL. XIII. NOVEMBER, 1892. No. 11.

Original Communications.[1]

DENTAL LAW AND DENTAL EDUCATION.[2]

BY W. E. MAGILL, D.D.S., ERIE, PA.

As members of our profession we are all interested in dental law and dental education: in law, as a check upon vice, a restraint put upon charlatanism; in education, as a beneficent, uplifting force, urging towards higher standards and better attainments.

Law is the result of discovered needs, the evidence of a desire to change the existing order of things. Especially is this true of dental law. For many years we were contented and comfortable without legislation, unconscious of any benefits to be derived from that direction, and it may be interesting to inquire whence came the innovating impulse to disturb this placidity of professional life. I think it may be traced to the influence of college education. Conscious of the benefits derived from enlarged opportunities, generous men desired to elevate the profession by establishing higher standards. Some, no doubt, labored for the public good, desiring to protect the community, so far as is possible, by legislation against the evils of ignorance and quackery.

[1] The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

[2] Abstract of paper read at Union Meeting of Pennsylvania and New Jersey Societies, July 20, 21, 22, 1892.

It may be true elsewhere, and I apprehend it is true in every State, as it is here in Pennsylvania, that all movements in favor of dental legislation have originated within the profession. While the ultimate and important effect of legislation is to guard well the interests of the people, outside of the profession, not from them has come the demand for laws to regulate practice, with a view to improved and more efficient professional knowledge. Indeed, there has been a disposition to gather, with local pride, around the uneducated and defend them, as if any law to compel education was an interference with inherent rights of "life, liberty, and the pursuit of happiness."

But the most active opposition to the enactment of restraining law has come from conservatism within our profession, from men established in practice under the old order of affairs, and who feared or disliked innovation, lest in some way it might unfavorably affect themselves. To disarm and conciliate this adverse influence, in all the earlier laws it was necessary to demand less and be satisfied with less than was desirable, on the part of those who asked for legislation, and who obtained what they could, trusting to the future for better laws, when experience should have proved the benefit to be expected from them. Bearing this in mind, you will be lenient in criticism of those laws first enacted, for they were the first steps cut in the face of a high rock of prejudice, beyond which our professional life has expanded, and now we stand with a wider horizon and more glorious prospect, union in our ranks, and professional jealousy banished, we hope, forever.

One of the beneficent effects of law in a State is to compel legislation in adjoining States. In Pennsylvania we were not fully conscious of the value of law until this became the dumping-ground for those incapables who were by legal enactments thrown out of other States.

In July, 1868, the Susquehanna Dental Association, then in session at Scranton, passed the following resolution:

"*Resolved*, That in view of the legislation obtained in several other States, this Association will most heartily co-operate with other dental Associations in any effort that may be made with a view to securing legislative action which shall define the qualifications of practitioners of dentistry in this Commonwealth."

In November of that year a call was published in the *Dental Cosmos* for a State Dental Convention, to be held in Philadelphia, December 8, 1868, "for the purpose of forming a State Dental Society." This organization was urged with the express view to

secure "legislative action to regulate the practice of dentistry within the State." It is thus shown that the very foundation of our associated life as a State Society is the desire to have clearly defined by statute what should properly be required, in the way of preparation and acquirement, of the men who proposed to enter this respectable profession, which had proved its value and importance to the health and comfort of the people.

Eight years of effort were required to secure the desired enactment, which became a law in April, 1876. The Pennsylvania State Dental Society, true to the object of its organization, was earnest in effort to secure legislation, and has been diligent to obtain enforcement of the law, which is one of the simplest and least elaborate to be found in the statute books of the States. It is not perfect. It is lacking in definition of what shall constitute practice. It does not assign to any public officer the duty of prosecuting offenders, nor does it provide a fund to meet the necessary expense to be incurred in enforcement. Under its provisions satisfactory work has only been done where a local Society, operating within a given district, has raised money and energetically undertaken the prosecution of those who were in unlawful practice. Notably in Pittsburg the value and soundness of the law have been proven, and in other portions of the State a few decisions by judges have so sustained the law that now no doubt exists of our ability to enforce its provisions, provided we have sufficient testimony to offer and money to pay expenses.

An amendment, secured in 1883, requires the registration of all dentists, either by diploma, certificate of State Examining Board, or affidavit setting forth time and place of continuous practice.

The public sentiment which sustains a law is of more value than the law, for without the support of such sentiment the law is worthless. Serious difficulty was found, in early attempts to enforce the law, on account of existing prejudice on the part of judge and jury, who considered its requirements arbitrary and unjust.

I cannot speak with authority of the effect of legislation upon the profession in other States, but here the influence in the direction of education has been distinct and beneficial. Men who had already commenced practice, with no preparation but a brief pupilage, were induced to attend college and graduate. Young men came before the Examining Board, and, failing to pass examination, returned home to study and prepare for college. The number of those who have applied to the board for certificates has decreased year by year, until now the apparent understanding is, that the man who

desires to enter practice must attend college. This is due to steady advance in the requirements of the Examining Board, and to progressive opinion in and out of the profession.

In these days we hear and read much in regard to dental law and dental education. There is an evident feeling of unrest, an agitation for something to be desired but not yet attained. And yet nearly every State has its law, and, we might almost say, its college. Certainly there never was a time when opportunities were so numerous to obtain what is called education in institutions proposing to teach students in dentistry.

In certain places much fault is found with the result of college education, and the demand is for fewer schools, more thoroughness in methods, and less strife for the longest list of matriculants. While admitting that there may be good grounds for such a demand, to me it seems more important that the character of matriculates and graduates should be carefully considered. As a rule, the honest man will be faithful in what he does to the extent of his ability, and the inevitable result of such faithfulness is improvement, advancement. The dishonest practitioner is an uncertain quantity, whatever his attainments, and with him careful operations depend upon mere whim or fancy for a patient, or opportunity to deceive. I do not feel much inclined to find fault with the man who thinks he is too poor to attend college, but obtains all the knowledge within his reach, and faithfully does his best for his patients; but I am disposed to censure severely the man who receives a diploma from a respectable college, and then trails it in the mire of disreputable methods, by which he expects to draw to himself business which, in the proper order of things, should go to another and better man. These so-called educated men, without correct principles, are the bane of professional life and character today. Having complied with the letter of the law and obtained a diploma, the man of this stamp is safe, as regards the law, in his disreputable methods, and taints the professional atmosphere with an odor which no disinfectant yet discovered can neutralize. Of course the modest man, who has high regard for the character and reputation of his profession, is at a disadvantage when these men who adopt the *rôle* of charlatan come between him and the public, waving their banners bearing cuts of artificial teeth, hanging out the immense gilded imitation of an upper first molar, and reciting tales of wonderful exploits in remedying defects real or imaginary. Unfortunately for the good man, a large portion of the community upon which he depends for support consists of those who judge

superficially, or are easily deceived by large pretensions, or have had small experience in the world. While he has a following that is satisfactory in quality, it may not be so in quantity. The truth is, that one of our serious wants, as a profession, is education among the people, who can demand and obtain what they need, whenever competent to judge, but will continue to be imposed upon so long as they lack knowledge of what constitutes professional ability and shrewdness in comprehending character.

Possibly we should demand and expect the college to stand between the public and the unworthy student; but, to do this effectually, in many cases the college must have the right to revoke or recall its diploma. We may not yet be ready for this advance in legislation, but the necessity for some such safeguard is already admitted, and the evil being known, we may safely depend upon the wisdom of our profession and popular enlightenment yet to come to work a reform.

We readily concede to the college the paramount influence in dental education to-day, but those whose professional experience dates back many years can remember a time when as an educational force the Association was greater than the college. Indeed, it may be questioned if even now laurels should not be divided. The direct influence of the college is limited to three years, whereas the Association continues to shed light and influence during all the years of one's professional life. It is a school where experience teaches and discussion draws out truth, and many opinions converge upon a given subject.

As a Society we have not undertaken the task of education, but by giving active support to the law we have contributed largely to the success of colleges, and thus to education. In return, we are indebted to these institutions for the cultivated men their ranks have furnished and for valuable contributions in all departments of professional knowledge. To the colleges we have a right to look for all that is valuable in progress and grand in principle. Our disposition is not to repress or discourage those who are doing a good work, as some surely are. We would rather unfurl a banner inscribed "Excelsior!" and, pointing to the legend, bid them Godspeed in the upward way.

As to legislation which shall require in every State the examination, by boards appointed for the purpose, of all who propose to begin the practice of dentistry, we see a drift of sentiment in that direction, but hope for such prompt and thorough action on the part of colleges as shall forestall the movement and render it un-

necessary. It is a wretched stigma to attach to our American institutions that their diplomas lie, and are of no value as evidence of preparation for practice. There is no necessity for any college to continue long under such a ban, and each should strive to be the first to prove to the profession and the world its determination to be free hereafter from even a suspicion of such incompetency as is charged.

As pertinent to the subject let me quote from a recent article on preparatory schools: "What, under the existing state of things, may be justly demanded? It is evident that there are many things, in themselves eminently desirable, that must not be expected, nor even asked for. The school cannot create brains. A certain per cent. of students never ought to attempt preparation for college, and are yet always to be looked for in preparatory classes so long as fond parents have their being. Even here the school can render a great service to the whole student body by shutting such incapables out of their higher classes through a system of rigid examinations, thus practically preventing them from ever reaching college halls."

This indicates a remedy within reach of every college. The lengthened term gives each institution what is equivalent to a preparatory school in its first year, and beyond that year no student should be permitted to go who has not shown himself fully up to all the standards as to character, skill, and intellect.

That there are serious defects in the present system of education pursued in some colleges we are obliged to admit. Every one who has much experience in employing young men recently graduated, is forced to the conclusion that somewhere a fault exists which should be remedied. Whence shall the remedy come? Unquestionably it should come from the college. What hinders such reform? The commercial spirit, which has too great preponderance in the origin and conduct of schools. How can this spirit be regulated or placed under control? By concentrating the influence of the profession upon this subject and in favor of reform, possibly by bringing the powers of the State to bear in exercising strict supervision of colleges and making them accountable.

We have seen that for dental laws now in existence our profession is mainly responsible, and the number is increasing rapidly. We will also be held responsible for our fostering care of colleges, to which we must look for all that is highest and best in dental education.

CROWN- AND BRIDGE-WORK.[1]

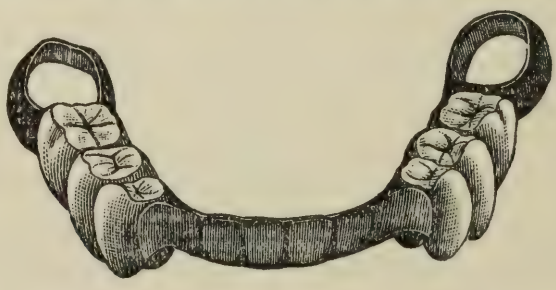
BY DR. C. M. RICHMOND, NEW YORK.

(Continued from page 740.)

I GIVE in this article a lower bridge (movable) which has been in constant use for eight years, and was the first attempt at this style of work by me. The missing teeth had been lost for some years, and the wisdom teeth had erupted and taken the position of the second molars. They had decayed badly, and were restored with gold crowns before the work was made for the case. After having finished this, a plaster impression was taken of the two gold crowns and the six front teeth; a fusible metal die was cast of each separately. Two bands for the gold molars were then made, using clasp metal No. 30. This works a little harder than twenty-two carat gold, but by getting the bands the right size to begin with, they can be accurately fitted with a small copper-faced hammer, referred to in a former letter. These two bands are then placed in position on the gold crowns previously fastened in position on the two wisdom teeth in the mouth. A plaster impression is then taken of each side of the mouth as far forward as the eye teeth, each side being taken with separate cups. I build up these impressions, after removing them from the mouth, with a little plaster, so that a fusible die can be cast into them without trouble. Each band is then taken off and placed in position in the impression where it belongs, and into the impression I pour fusible metal. This can be done without any danger, as the metal melts at so low a temperature that the gold and metal will not stick together in the slightest degree. After the metal is cold, the impression is taken away and the die is perfect, with the clasp metal band in position, and I have a fac-simile of the mouth with the bands in position. A piece of pure gold plate, No. 30, is now taken and burnished on to the ridge, from the bands forward to the eye teeth. While in this position, the band and gold plate are waxed together at the points of contact. I now pour over the plate and bands some investment material, which, when removed, is really an impression of the die. The plate and bands are placed in position in the impression of investment; this brings them into the same relative situation as when they were on the dies. I now fill with more investment, and, after hard enough, the top is cut through, exposing the point where the gold plates and bands join one another. These

[1] Copyrighted, 1892, by Dr. C. M. Richmond.

are placed on the fire, and, when hot, soldered together. As will be seen by referring to the cut, the plate does not touch the gum tissues or come far enough forward to show on the face of the eye teeth. In this case I make the parts separately, like the others I have described, and in the same way, only there is no clasp in front. A piece of pure gold is burnished into the die made of the six front teeth, the same shape as shown in the finished case. I invest this piece, and using a piece of clasp material, which I bend near enough to the shape of the gold it is to cover, so it can be soldered into position without trouble. To facilitate matters, I always cut my gold and clasp to a pattern made of a piece of heavy tin-foil, the same as if a whole gold plate or gold for a partial plate were required. After these pieces are finished to this point, the bands with the gold plates soldered to them are placed in position in the mouth. The plate is tied to the front teeth, so that it will be impossible to disturb it while taking the impression for the last model.



The gold pieces being all in place in the mouth, a plaster impression is taken over all. After letting the plaster harden thoroughly it is removed, and the front piece and the bands with the gold plates are placed in the impression, and into this is poured a model of investment, as I wish to use this to do the last soldering on. The case is placed in an articulator and the teeth ground in, letting the lower ends of the teeth go a little below the gold plate, and perfectly fitting the gums, grinding the first bicuspid to completely cover the gold which comes around the distal surfaces of the eye teeth. The teeth are backed with pure gold, waxed into place, and invested with the model which they are ground on to, as it is made of investment. The whole of the soldering is done now. To fasten the teeth on to the plate, solder the teeth together, and lastly solder the front part to the first bicuspids and plate, and make the case complete in one piece, as shown in the cut. The best result with the minimum amount of material is obtained in this operation, and it is in the mouth, perfect from an artistic point of view.

(To be continued.)

THE PHILOSOPHY OF THE HOMŒOPATHIC LAW OF CURE, AND THE ADVANTAGE TO THE DENTIST OF A CORRECT KNOWLEDGE OF ITS APPLICATION.[1]

BY CHARLES H. TAFT, D.M.D., CAMBRIDGE, MASS.

THE subject which I have chosen for my theme is one upon which nothing, to my knowledge, has ever appeared in print in the literature of our profession. In view of the rapid strides which dentistry has made within the last half-century, the character of the men who, with the wisdom born of a combined intelligence and rare inventive turn of mind, have brought the standing of our calling up to the full dignity of a liberal profession, the earnestness and the willingness of our brethren everywhere not only to seek after but to recognize truth wherever found, whatever its nature, it may seem strange that the grand principles of homœopathy should not long ere this have been recognized as furnishing one of the most important and efficient aids for the full and proper performance of all that the public expects of us as dentists. And yet, in view of the fact that in no dental school in the country, so far as I know, with one possible exception, is the materia medica taught on lines other than in harmony with the views of the allopathic or so-called regular school of medicine, it is not to be wondered at that when surgical or mechanical treatment fails to give the relief which the dentist often justly feels should follow the performance of an operation, he is then absolutely "at sea" as to what further course to pursue, unless it be to fall back upon palliatives, counter-irritants, and narcotics for the temporary relief of pain.

Before going further, let me assure my hearers that nothing is further from my purpose in this paper than to cast any discredit or reflection upon any school of medicine, or upon any one whose views in any way differ from mine. If I appear to be too aggressive, be assured it is merely because of my desire not only to disprove the assertion so often heard made, that medicine is not an exact science and never can be, but to prove that when practised in accordance with well-established laws it cannot possibly be anything else.

There exist to-day throughout the civilized world two promi-

[1] Read before the Massachusetts Dental Society, at its Twenty-seventh Annual Meeting, held at Boston, July 7, 1892.

nent schools of medicine: the one, the old, or so-called regular school of medicine; the other, the homœopathic, or new school of medicine. The former rests upon a mass of theories, experiments, and facts,—all good in themselves, to be sure, but without any effort or attempt being made to detach and put them together in their logical order or relation to each other. Without systematic organization of knowledge there can be no such thing as science, and since our friends of the old school make no claim that their system is founded upon any knowledge other than what is purely empirical, I believe they are honest when they affirm that medicine is not a science and never can be, and I agree with them fully so far as their method of practising it is concerned. Nor is it to be wondered at that without a well-defined knowledge of the toxical and medicinal action of the various drugs which the physician may make use of, and in the absence of any good and sufficient reason or principle whereby he chooses a drug, or more generally mixes several of them together for the treatment of disease, he might naturally mistrust the foundation upon which he stands in the practice of his profession, as well as his ability to effect a speedy relief from pain or a permanent cure.

How different is the case with him who is guided in his methods and treatment of disease by principles founded upon purely inductive and deductive processes of reasoning, leading up to a well-established law of cure as scientific and universal in its application as the laws governing the movements of the heavenly bodies, and indeed all the natural or physical laws which govern the whole universe!

The homœopathist claims that medicine, when practised in accordance with the teachings of Hahnemann, is therefore not only a science but an exact science, because it rests upon a fundamental law; and we come now, first, to the consideration of this law of cure, and afterwards to the consideration of how it concerns the dentist in his every-day practice.

Briefly stated, this law is expressed by the phrase *Similia similibus curantur*, which means that for the proper treatment or cure of any disease a medicine must be selected which would produce symptoms similar to those manifested when administered to a person in health.

To test the correctness of this law one has only to prove it upon himself or others to be convinced of its accuracy.

The first question, therefore, which naturally arises when a patient presents himself with any particular disturbance of the

vital force is, What medicine will produce a similar group of symptoms when taken in a state of health? When, after carefully making note of all the symptoms, subjective as well as objective, we select a remedy which reaches the totality of all the symptoms, —in other words, when we have found the similimum, or similar remedy,—we give the medicine with the utmost confidence that it will produce the desired result. There is no guess-work nor any hit-or-miss principle about it, as obtains where the physician is guided by no scientific principle in the selection of his remedies.

We recognize, therefore, that every medicine must have a certain definite action; first, its physiological or toxical effect upon the different organs and tissues of the body, and, secondly, its medicinal or curative action. By studying the physiological action of a given drug we find that it has certain characteristics which distinguish it from other drugs. We find that different drugs affect in peculiar and in different ways the brain, the heart, the lungs, the digestive organs, the bones, the muscles, the mucous membranes,—in fact, all the different organs and tissues of the body,—each one producing well-defined symptoms in localized parts of the system, and by the process of reflex action affecting thereby the whole system.

Conversely, by studying the nature of disease, we recognize that there is, as Hahnemann says, a disturbance of the vital force which manifests itself in plainly-marked symptoms. In other words, the organs or tissues, which are for the time being in a condition of abnormal functional activity, find themselves not in harmony with the rest of the system, and to effect a proper restoration to health of the parts concerned, harmony must be restored.

To demonstrate the philosophy of the homœopathic law, therefore, we must show that the only intelligent and scientific method of restoring harmony is by the administering of what is termed the similimum or similar remedy, and this brings us naturally to the consideration and proper understanding of the laws which govern the action of drugs: the first law being, that every drug produces two entirely opposite effects: the first, the primary and transient effect; the second, the secondary and permanent effect.

To make this law clear by illustration: an old-school physician prescribes, for instance, a cathartic for constipation, and what is the result? The patient soon has a violent diarrhœa, the intestines being forced to an unusual and an unnatural activity. In a short time the primary effect passes away and the secondary effect takes its place, leaving the intestines again in a state of torpor and the same or a more aggravated condition than before. The relief has been, to

be sure, a temporary one, but the subsequent condition is worse than the first.

Again, morphine is a drug too often employed for the relief of pain and to simulate sleep. Its primary effect accomplishes this, but what is its after-effect? Increased sensibility and restlessness, which requires in every case an increased dose to again allay. Many other examples might be cited, did time permit.

The second and equally important law is, that precisely opposite effects can be produced by the same drug, according to the quantity in which it is administered. The idea has long prevailed in the old school that if a drug was good for anything it must be administered in a large dose to be productive of any good; but this idea, fortunately for humanity, is fast falling into a state of innocuous desuetude, and the practice of allopathic physicians in this respect is becoming very materially modified. The remark of Dr. Oliver Wendell Holmes in this connection, and his scepticism as to the value or efficacy of medicines when so administered, so far as their therapeutic value is concerned, is too familiar to us all to call for any repetition here on my part.

To illustrate this second law: we know that small doses of rhubarb and calomel sometimes allay irritation of the bowels and cure diarrhœa and dysentery, while large doses produce precisely opposite effects. Again, small doses of ipecac and tartar emetic may be given for their curative action in cases of disordered stomach with vomiting, etc., while large doses of the same medicines bring about these same abnormal conditions. Small doses of cinchona may cure chills and fever, while large doses produce the same conditions; and so on, in countless similar ways, do we see the action of drugs operating for good or evil when administered in sickness or in health, in accordance with well-established laws.

How simple, then, and easy of comprehension is the homœopathic law of cure, and with what force does it commend itself to our reason and intelligence! The difficulty which seems to present itself most strongly to the opponents of homœopathy is the inability or rather, perhaps, the unwillingness to recognize that there can be any power or force in anything not plainly presented to our bodily senses, and in what may honestly appear to them to be contrary to ordinary common sense, and so rather than helping by patient investigation and study to add to the sum of human knowledge and human happiness, so far as their desire of arriving at any purely scientific system of medicine is concerned, they are contented to stand aside, and make general assertions and denials, which, being

expressions of opinion only, have no scientific value, and are therefore worthless.

But it is no new thing for truth of any kind to meet with abundant opposition. The reception of the discoveries which followed the invention of the telescope, and the ridicule and condemnation to which Galileo was subjected for the promulgation of his theories as to the laws governing the movement of the heavenly bodies, is only equalled by the same ridicule and opposition which, even in this enlightened age, is meted out with a liberal hand not only upon a now universally recognized system of medicine, but upon all who have the courage to practise medicine in accordance with its teachings. But let the doubter in our own profession, and all others who take exceptions to the truth of the homœopathic law of cure, do as I have done,—put the principle of it into every-day practice. I can assure you the results of your work, when once you begin to thoroughly understand your subject, will surprise and astonish you. Lest a man may not have sufficient faith in the efficacy of the higher potencies, I would advise him to first begin with the lower ones, discarding them as his success and familiarity with them lead him to a greater and more satisfactory success with the higher ones.

We come now to the second part of our subject, and I can, perhaps, best illustrate the method of applying the homœopathic law by citing a few cases in practice.

Suppose, for example, a patient presents himself suffering with severe pain in the teeth or face, the result, it may be, of an exposed pulp, an inflammation of the pericementum, a gathering abscess, or the result of other causes producing an annoying train of symptoms. Our first aim is to select the proper remedy which will afford the speediest relief, and in order to make the right selection we must first compare the symptoms of the patient with the remedies which apply to them, and then compare the medicines selected with the symptoms in question.

It is my practice to take careful note of every symptom, writing them down if necessary, getting, so to speak, a pen-picture of the case. Among the various symptoms one may readily recognize one or more key-note symptoms, which instantly suggest a given remedy. It may happen that not all of the symptoms of your patient will be found under the drug which seems to be the indicated one, in which case it will be necessary to turn to other drugs and compare the symptoms as laid down under those remedies. But it must so happen that all, or at least the greater part, must be found under the drug selected, in order to give the desired

relief or to effect a permanent cure; and when such a selection is made, you give the medicine to your patient with the utmost confidence and assurance that it will produce the desired result. There is no guess-work nor humbug about it, and your patient will not be likely to attribute the curative action of the medicine to his imagination, or be so ungenerous as to say that relief would have come at just that time without the medicine.

To make my meaning still clearer, permit me to illustrate by one or two cases in practice:

On February 8, 1892, Miss W. came to my office with a large corono-distal cavity in the right inferior second bicuspid. Careful excavating failed to avoid an exposure of the pulp, which was carefully treated, and capped by applying oil of cloves, and dusting a thin layer of the dry oxide of zinc directly over it, then filling the cavity with oxyphosphate, avoiding all pressure. This, I may say in passing, was a case which, when treated in this manner, rarely gives my patients any further trouble. But this one proved an exception to the general rule. The patient began to suffer almost immediate discomfort, which grew worse from day to day, and continued with almost uninterrupted pain for nearly three weeks. The patient was as unwilling to have the pulp destroyed as I was to suggest its being done as a *dernier ressort*, and temporary relief was afforded from day to day with capsicum plasters until they were without further efficacy. On February 27 she came to my office almost frantic with pain, and saying she could bear it no longer. The following symptoms were present: Great soreness and lameness of the tooth; soreness of the gums; pains extending into the upper teeth and round to the wisdom tooth on the left side. Aggravated in the cold air and by hot and cold things taken into the mouth; worse after eating and in the early part of the evening and night; relieved by hot external applications; great dulness and tired feeling in the eyes.

Turning to the repertory, we find the following remedies for—

1. Soreness and lameness of the teeth: Arsenicum, belladonna, bryonia, causticum, mercurius, nux vomica, sulphur.

2. Soreness of the gums: Bryonia, carbo vegetabilis, graphites, mercurius, natrum muriaticum, rhus, pulsatilla.

3. Pains extending to upper teeth: Nux vomica, sulphur, rhus tox., hyoscyamus, lachesis, mercurius.

4. Worse in cold air: Hyoscyamus, belladonna, mercurius, calcarea carb., staphisagria, sulphur.

5. Hot and cold things in the mouth: Rhus, bryonia, calcarea, nux, pulsatilla, staphisagria, sulphur, mercurius.

6. Worse in early part of the evening: Bryonia, chamomilla, natrum muriaticum, rhus, sulphur.

7. Relief from hot applications: Arsenicum, belladonna, calcarea, hyoscyamus, chamomilla, lachesis, mercurius, nux vom., pulsatilla, rhus, staphisagria, sulphur.

8. Dulness of eyes: Arsenicum, belladonna, bryonia, hyoscyamus, mercurius, nitric acid.

After striking out all the remedies which occur only once or twice, we find that arsenicum appears three times; natrum muriaticum, four times; pulsatilla, three times; staphisagria, four times; hyoscyamus, four times; belladonna, five times; nux vomica, five times; rhus, five times; bryonia, six times; sulphur, seven times; mercurius, eight times.

If we now examine the symptoms in the materia medica under mercurius and sulphur, we shall find that these will be the indicated remedies, and we give the preference to mercurius, as that more nearly reaches the totality of all the symptoms.

This remedy was, therefore, given in the above case in the two-hundredth potency, with absolute confidence that it would quickly give the desired relief. I neither saw nor heard from the patient for a month, when I received a letter, stating that "the medicine had served its purpose well, that the tooth had given her no further discomfort, and that she felt she should have no further trouble with it, and was furthermore heartily glad that the pulp had not been destroyed."

Frequently a patient presents himself, complaining of severe pain in a tooth, which, we have reason to suspect, may be abscessed, although the process of suppuration has not become sufficiently advanced to cause any lameness or soreness, either in the tooth or peridental membrane. It may happen that the tooth has a large filling, and from the appearance we may expect the pulp has died beneath the filling, but we do not wish to remove it only to find possibly a live pulp. No fistulous opening exists; the teeth and tissues about the affected region all present a healthy appearance, and the fillings are all in good order. The patient, nevertheless, is suffering violent pain, which demands immediate relief. What is to be done in such a case?

My own practice would be such as was adopted in the case of Mr. S., a student at Harvard, who came to my office on May 3, complaining of severe pain in the left inferior first molar with the

following symptoms: Pain commenced the previous afternoon, growing worse towards evening, and kept him awake nearly all night. No pain nor soreness in the tooth itself or gums, but a dull, steady ache, starting in that tooth, and radiating through the bones of the face and up into the temple. Aggravated by hot things and after eating; also worse in the warm room. Cold water held in the mouth gave relief, but only temporarily; also relieved by being out in the open air. Could eat on that side with perfect comfort. Patient remarked that the tooth (the sixth-year molar, bear in mind) was dead and had been previously treated. His symptoms, it seemed to me, pointed strongly to bryonia, which was accordingly given in the divided dose,—that is to say, dissolved in water, one tablespoonful every half-hour until relieved. He came back in two or three hours, reporting no relief whatever.

Knowing, therefore, that I had not selected the right remedy, I made the case the subject of still further study. Noticing a large amalgam filling in the crown of the twelfth-year molar back of it, and suspecting a gathering abscess at its root, although there was no soreness in the tooth whatever, and nothing to indicate any possible cause of the trouble except the filling, I prescribed silica to confirm my diagnosis and to hasten the process of suppuration, saying to the patient that the medicine would in all probability give him speedy relief, and that he would come in to see me the following day with his face considerably swollen. He appeared at my office the following afternoon, reporting entire relief from pain within two hours after he left me the day before, when he went to sleep and slept all night, awakening in the morning to find his face in the swollen condition I had anticipated.

Examination showed at once that the twelfth-year molar and not the sixth was the offending tooth, which was then at once opened into and treated.

The above are cited as illustrations of the many cases that come up in the daily practice of every dentist, and were it within the limits of the paper, I should be only too happy to give many more to show how easily and quickly all sorts of disturbances of the vital force affecting the oral cavity, which we as dentists are expected to know how to intelligently treat, may be made to yield to the gentle curative action effected by the high potencies of the proper indicated remedies.

It not infrequently happens that a patient, unaccustomed to homœopathic treatment, will express an incredulity and great scepticism as to the power of the innocent-looking medicine to do all

that you assure him it will do; but I have yet to find such a patient who not only gratefully but generously gives the credit of his relief from suffering to the action of the medicine, and who is not at the same time the most enthusiastic sort of an individual, simply because he cannot understand *how* the medicine should work as it does. *That* it does he is amply convinced. Of the fact that it was not his imagination, he is also convinced.

In conclusion, let me say that if I have succeeded in awakening any interest in a subject intensely interesting to me, as I bring the application of it more and more into a busy every-day practice, I shall not regret having so heavily taxed your time and patience at this somewhat late hour. When once you begin your personal investigation, and study to become thoroughly acquainted with the action of drugs and the laws which govern it, and have tested by actual observation and experience the much greater efficacy of the higher potencies over the lower ones in some of the commonest kinds of toothache even, you will then, at least, have given yourself the satisfaction of rendering to your patients some real benefit, as well as having begun the study of the art of healing upon accurate, and therefore necessarily scientific, principles.

THE VALUE OF ILLUSTRATIONS IN THE LECTURE-ROOM.

BY L. D. M'INTOSH, M.D., D.D.S.

THE object of this paper is to point out to those who are interested in the work of the lecture-room what we believe to be one of the best methods of illustrating the various branches taught. I think I am safe in making the assertion that teachers in all departments of study see the necessity of illustrations.

Abstract teaching alone, either by lectures or recitation, fails to produce as permanent an impression on the student as is accomplished by illustrations. For example, we may give a description of a city, or some place we are familiar with, to a class of students, and afterwards ask them to explain the same; we find that no two understand it as it was given. If views had accompanied the description of the place, showing the streets, buildings, etc., each student would have formed almost as correct an idea as though he had visited it. We see how attractive and instructive the public lecturer can make his subject by using views of the scenes he por-

trays. It has become a necessity for him, if he desires to describe his travels, to illustrate them. The public demand this, and enforce their demand by their absence when no illustrations are shown, and, on the other hand, their approval by the large audience present when his lectures point to life-like scenes. The following shows the value of these and the permanent impression produced on an audience:

Some twelve years ago I gave a series of popular illustrated lectures in Chicago. One was entitled "Microscopic World." In the course of the lecture a description was given of the structure of a human lung, its capillary net-work, congestion, etc., using a microscopic section projected on a screen, so that it could be plainly seen by all of the audience.

Many of the persons present afterwards referred to the illustrations, that, although they had studied the subject before, this was the first time it was clear to them. Only last winter a person who was present at this lecture referred to the lecture: he said, "I am just recovering from a severe cold which came near resulting in congestion of the lungs. I imagined I could see the fine net-work of blood-vessels, in which the blood had ceased to flow, and I knew the proper thing to do was to cause it to circulate. I remembered what you said about counter-irritation and application of heat to bring the blood to the surface of the body and thus relieve the congested lung. I produced free perspiration, applied mustard-plasters freely, and was relieved in a short time."

This simply shows the impression produced by the illustrations. We can all remember the lasting effect made on us when young by the experiments of the itinerant scientific lecturer. I think my love for scientific study was awakened by listening to an illustrated lecture on natural philosophy when not more than ten years of age. It was not the words or the title that I remember, but the experiments, which seemed very wonderful to me, and are as vivid to-day as though I saw them but yesterday.

Some ten years ago I attended a medical society in a neighboring State. An evening was devoted to microscopic illustration, using a projection microscope. The public was invited, with the idea to entertain and at the same time show the scientific side of the study of medicine. A large audience was present, and all seemed interested. The work of that evening passed from my mind. Some four or five years afterwards a physician called on me; in his conversation he inquired if I remembered giving microscopic illustrations and assisting Dr. A. at a certain State medical meeting. I

told him I did. He said he was present, though not a physician at that time, and those illustrations seemed very wonderful to him. He said until this time he had looked on the profession of medicine indifferently, but what he saw that evening proved the first incentive to commence its study.

I am often chagrined and disappointed, after carefully writing a description of a scientific instrument and the directions for its use, to find the purchaser has either failed to comprehend them, or they do not give the idea clearly. A well-posted physician not long since obtained an instrument for electrical measurement. After several unsuccessful attempts to use it, he wrote me of his failure. He afterwards brought the instrument, and we placed it in proper position with connections, and it worked all right. There was one point in the directions which he did not interpret as it was intended it should be, therefore his failure; but when he saw it connected and used, the directions were plain to him.

The use of every scientific instrument and process, to be clearly understood, should be demonstrated and illustrated. Unless illustrations accompany the description, the idea is only partially comprehended. All descriptions in applications for patents must be minutely illustrated in detail, and even then expert examiners are often obliged to obtain models to aid them. If illustrations are so necessary to aid experts in comprehending descriptions in a special line, how much more does the student need them in the lecture to which he listens!

In nearly all our schools, from the primary department to the highest grades, the teachers see the necessity of illustrating their work as much as possible, and are constantly devising apparatus to do this more perfectly. The departments of Chemistry, Physiology, Anatomy, Materia Medica, Microscopy, Histology and Pathology, Operative and Prosthetic Dentistry, in fact, all scientific studies, require illustrations. Yet, with all that is being done, we believe this work is in its infancy. If there were greater effort to make a subject plain, the description cut short, given in few words and to the point, the student would retain what he sees and hears. The scientist, and even the man confined to the office, have caught the spirit of illustration. When they take their vacation, a Kodak camera is their constant companion. By its aid they bring back pictures of the country they have visited, to show their friends. Even the clergyman finds he can interest his hearers by giving an illustrated sermon, and fill the seats that would otherwise be vacant.

I believe there is no way of illustrating as easily, clearly, and cheaply the science of medicine and dentistry as by projection. We have at our command very perfect apparatus for this line of work; we can use diagrams, photo-micrographs, micro-photographs, microscopic specimens, opaque objects, chemical reaction, crystallization, polarization, etc., to large classes as easily as to one person. To make this point clear I will give you a few illustrations. Suppose my subject for consideration to-day is the circulation of the blood. Here we present to the class a diagrammatic representation of the systemic circulation, and point out its course through the vena cava into the right auricle, to the right ventricle, through the pulmonary artery to the lungs, through the capillary net-work surrounding the air-cells, back through the pulmonary vein to the left auricle, into the left ventricle, through the aorta, and through its circulatory journey. Let us now project a microscopic section of the lungs. Here we see the ultimate capillary net-work surrounding the air-cells, connective tissue, etc.; with other specimens we could show the epithelial lining, in fact, follow out all the detail and minutiæ on the screen perfectly as though we had our specimens on the stage of a microscope; and we have this advantage: we can describe it to all the class as easily as to one member, and can point out any particular structure, which we cannot do when we use the ordinary instrument. We will take another example for illustration—a diagram of the tooth, showing the enamel, dentine, etc.—and follow with a microscopic specimen. This we can see on the screen almost as plainly as with a diagram. With these illustrations the way is paved for intelligent work with the microscope in the laboratory. When a student mounts a tooth section and places it under the microscope, he sees a familiar object,—just what he has seen by the aid of projection and heard described, even to the color and delicate tints of shade. Had the lecture description been given on a blackboard instead of by the aid of actual specimens projected on the screen, he would not have recognized them when he came to the actual specimen under the microscope. We will refer to another illustration that can be made very instructive and interesting to a class,—namely, the circulation of the capillary net-work of a small fish or foot of a frog. Last winter I projected by the aid of the sunlight the circulation in the foot of a frog before a class. Capillaries were shown from one-half to two-thirds of an inch in diameter; the red blood-corpuscles could be plainly seen coursing through them, with now and then a white one in the field. When the web of the foot was pricked with a needle, the vessels

congested round the wound, and the wounded end of one capillary projected into the opening, which appeared about three inches in diameter; the blood-corpuscles were ejected in the stream with each impulse of the heart; the circulation became slower and slower until the congestion was complete. The foot was released, rubbed to establish the circulation, and after a short time placed again under the field of the microscope. The circulation was now seen over the entire field, except the wounded part. In this short hour we had seen the circulation in the capillaries, the migration of white corpuscles, congestion, bleeding capillary, showing the impulse of the heart extending through the small vessels and the re-establishing of the circulation by massage after it had ceased. Could any description given have made the same vivid impression on those students as the illustration described?

We might continue these illustrations by projecting specimens of every tissue of the body, but we think what has been shown will demonstrate our point. The anatomist can use photographic transparencies of any part of the body and gain in size and accuracy over the use of charts and drawings, as the object can be greatly magnified and made plain to a large class.

The chemist can use this method to advantage in the lecture-room by projecting reactions, crystallization, electrolytic action, etc., and thus pave the way for the student to begin his laboratory work with a clear idea of what he is to do.

The physiologist is dependent on illustrations to make his lectures clear, and is obliged to refer to anatomical charts and microscopic specimens. The teacher of pathology is equally interested in illustrating his work.

This method of projection is not confined to transparent bodies. Opaque bodies can as well be magnified and projected on a screen. The principle is not new, but its application to a projecting microscope we believe is. Some two years ago a scientist desired me to make for him a microscope to project objects by the aid of oblique illuminations. In constructing the instrument I found that with a little modification it could be made so as to project opaque objects. Without taking time to describe it, I will give a few illustrations of its use.

We will place a tooth on the stage, and by the aid of reflection project a clearly-defined image on the screen. In this manner any small opaque objects can be magnified and plainly shown to a class. Malformations of teeth and root, pulp-nodules, fissures, etc., can be shown by making transverse and longitudinal sections, and any small

instrument or mechanical device can also be seen in this way. It is believed the teacher of operative dentistry will find in the projection of opaque objects a new field of illustration.

This method is in its infancy. There is no want of apparatus, or of light for illumination, but there is no complete list of objects, either photographic or microscopic. Each teacher is at work in his own way and uses such specimens as are within reach.

We have text-books profusely illustrated and systematically arranged. Now, what is needed is photo-diagrams, photographic transparencies, and typical microscopic slides, so that the text-books and lectures can be fully shown on the screens before classes. Drs. Sudduth, Andrews, Hays, and others have done much in this direction, each in his line of work. Others are engaged in their specialties. We trust the time is not far distant when typical objects properly arranged in sets, both photographic and microscopic, can be as easily obtained as text-books on the various subjects. The teacher will then have his notes before him in his illustration. He can abridge his lectures; this being accomplished, the poor student will not feel that he is being talked to death.

HOW CAN WE MAGNIFY THE IMPORTANCE OF OUR CALLING?[1]

BY G. A. MILLS, NEW YORK CITY.

Coming as I did from a Massachusetts inland town to New York City, May, 1861, and imbued with a sincere longing for a something allied to professional attainments that I did not possess, I was by virtue of such circumstances ready to accept any proffered association that might lead to the satisfaction of my desire.

During my entire adult life I have found that it is the most unexpected that comes to us, and in no part of my career has it been more noticeable than in my professional life.

Dr. W. H. Atkinson, by a very providential experience, was also directed to New York City in June, 1861. That his coming has proved a valuable event to the entire dental profession hardly needs any emphasis from me.

This was seemingly a novel transit for such a character, so unconventional, to be transplanted into a metropolitan atmosphere.

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[1] Read before the California State Dental Association, July 22, 1892.

Very few of the dental profession in New York City, then including the prominent names of Drs. Parmley, Dwinelle, Duning, Rich, Foster, and Dodge, gave him any recognition; these practitioners stood for all that was thought to be the standard. Dr. Atkinson's coveted endowment was a fraternal nature, and with it the unusual accompaniment of mental capacity that has known no equal in our ranks. He was truly a "teacher of teachers." These characteristics soon surrounded him with a class of listeners. In those days there were some that called him egotistical, but those now living can recall how childlike he seemed as they gathered eagerly about him and assimilated his instructions.

Dr. Atkinson's advent and its success was certainly phenomenal, both in his finding earnest listeners and a full demand for his services. This last encouragement was largely added to by those that came to witness his clinics, which were given on each Monday forenoon. At these clinics he never failed for need of patients, for he could always find a suitable case among his audience which he could use as valuable instruction. The novelty first introduced by him was the hand-mallet, which was truly an innovation, but adopted almost by acclamation. It was then an ivory one: note the many devices since. Cohesive gold added another attraction; although its use was not unknown, yet it had not been generally adopted. Contouring teeth deformed by caries was still another. He carried war into the common practice of deforming teeth by file and chisel, and denounced this as a sacrilege. While the method of contouring teeth had become a part of our literature, yet it had at this period taken but little hold of general practice. True in all his observations in nature, he called attention to the fact that to contour a tooth did not supply the demand of nature's use in a proper mastication. He demonstrated her needs in the mouth,—viz., that lateral support throughout the entire arch was required. From this method originated the term "knuckling" teeth together. This idea was not easy to inculcate in the minds of many, for the prevailing practice of "self-cleaning spaces" predominated. It was for this purpose that he introduced the wood matrix to exaggerate the space, that he might secure the firm support of tooth to tooth. Who will say at this day that he wrought not wisely and well in suggesting this valuable method, so largely recognized now by good operators, and for the lack of which much discomfort and loss of valuable teeth has resulted?

I need only recur to these things to make the record true, and pass on without further detail, except to notice, for the benefit

of young practitioners, the fact that this radical reform was commenced without the use of dental engines and rubber dam. Think of the amount of hard, close, confining labor performed by hand instruments. This was in the spring of 1862, and rubber dam came in 1866, the engine in 1870.

We have gone over glibly this first step in an out-and-out reform, which has come to remain as long as teeth need repair by the facilities now known. At this time disordered conditions of teeth were not looked upon as in any large degree amenable to surgical dealing with faith in their future usefulness. "You can deal successfully with alveolar abscesses, acute and chronic, with as much hope of success as with any other part of the body," was emphasized so confidently by Dr. Atkinson that many a good practitioner replied, with a quick breath, "That is just what we all want to know how to do;" and just here he saw the necessity for foundation-teachings. Many of us will recall his familiar manner of accepting all men at first call, as knowing something of the things he was dealing with, yet often, finding how little was known, he would turn the major part of his interview into a teaching class. From the start he found it absolutely impossible to progress with his clinical cases without prefacing them with instructions. Sometimes his dealings were gentle, and then the opposite, for he would not let any one pass himself off for what he was not without trying, at least, to put him on the track of intelligence, regarding it as true friendship to lead one away from an error. What an example worthy of our best emulation!

Returning again to the surgical treatment of alveolar abscess. Heroic attention from the start: creosote, No. 1, iodine, No. 2,—a saturated solution of crystallized iodine and creosote, half-and-half. Tannin and glycerin, No. 3; put all the tannin into a portion of glycerin that it would take up, making a stiff ointment. What have we got in the place of these? If dead bone were associated, officinal preparations of aromatic sulphuric acid were used; if superficial, the burr was called upon to remove it. This we will refer to later as the introduction of a systematic method dealing with surgical territory.

We return again to the application of the wood matrix. The idea was to get direct access to all cavities, so far as practicable, and, by the aid of wedge or matrix, to arrive at a proximal cavity direct through the grinding surfaces. This was in direct opposition to the then common mode of procedure. To reach these obscure decays space was made by rubber pressure, which he condemned wholly,

claiming that quick and rapid moving of teeth was the safest and most humane. It is easy to review, by a little activity of the mind, how evolution has carried us on. But all these facts will show that he was working a decided reform in dental practice, which was constantly italicizing the importance of saving teeth in a far larger sense than any practitioner had ever before advocated, and out of his intensity originated the saying that followed him ever after, "To extract a tooth is an evidence of disability to save it." Is it not true to-day?

I cannot attempt to lay before your thought the multiplied detail of reminiscences that crowd upon me, so I must part company and press on to those things that are to be made to emphasize the subject I have in mind. It soon came to pass that Dr. Atkinson's field was too circumscribed for his growing enthusiasm, and with his nucleus of ardent followers, he at the head and front always, came the formation of associations. The first body of this kind that had captured the attention of progressive men was the well-known society, the Brooklyn Dental Association. It was in this society that we first met the delegation from California. If I recall rightly, the late Dr. Dutch was the first on the roll, for every visitor with any purpose was made a member, Dr. Knowles being the next in order. This must not be confounded with the Brooklyn Dental Society, for that body was not in existence before 1866.

The Brooklyn Dental Association held a name to live, and it did live, and it made alive all members that came in touch with it. What characterized it so much above anything before was its fraternal nature, generated by Dr. Atkinson alone. He became the moving and guiding factor with the entire body. For membership it knew no particular locality, only that the person was in pursuit of knowledge. With Dr. Atkinson a dentist was a dentist, and he did not feel that he bemeaned himself that he aided the unwashed. Some men that he has helped and made fit for better things may have forgotten the pit from which he did more than any other to dig them and to put them into a position of usefulness. Do they show themselves as liberal towards their needy brothers?

With the growth of liberal associations Dr. Atkinson's opportunities widened for the greater work for which he was fitly prepared; we add, chosen, and no meeting was complete until his voice had been heard. How many are the occasions that we can recall that he awakened us to a high pitch by his enthusiastic fervor! Many said he talked so high into the air that common mortals could

never hope to follow him. How is it now? Are we not following him in many ways more than we think, or even know, to-day? A consensus of his writings would show us how definitely he has outlined the path of scientific attainment for future advancement. They are replete with the discussions of basal principles, without a knowledge of which we cannot hope to build an enduring work. His articles upon Histology, Microscopy, Inflammation, the Origin of Pus, are rich with information, and he who becomes most able to assimilate such will become more a master of his calling. These articles are truly the whisperings of "the angels." Note this, they will never need any revision from us. A pet idea of his, he did not live to see put into practical operation,—viz., teaching the student over the case; telling to each one, directly, his own needs. Professor Truman has hinted his leaning in this direction. The school that first puts it into operation will set a potent example for good, and a lasting benefit to our calling. It will give education such an impetus as it has never known. Preaching dentistry by platform oratory is too stale for any one who has a mission in life to be patient enough to wait to hear. Whatever some may think of what have been termed vagaries of Dr. Atkinson, his spirit has become infectious, and the work of the future will be more zealous because of it.

I have only lightly surveyed this hurried work of his, as he has come and gone before us, so often in his quickened movements, yet even this will serve to inspire us in the retrospect. One point I desire to emphasize, so that it may become indelible in all minds; viz., thirty years have passed, and Dr. Atkinson's name stands, and must ever stand, as the founder of an advanced school of practice in dentistry.

I have gone over principally the mechanical phase, as this was more in the minds of his first admirers, and by this the door was effectually opened to emphasize the larger thoughts which were only waiting to be brought forth. The advancement of the views of such greater possibilities in the saving of teeth produced a suitable soil for the advocacy of a practice beyond anything before thought of, and this doctrine became imbued in the minds of wise-thinking practitioners. Dr. A. C. Hawes was inspired to offer that effectual resolution in the Brooklyn Dental Association, calling the serious attention to the ruthless destruction of the natural teeth by extraction. Compare the value of a human tooth then and now. In the light of the minute anatomy as given us by Heitzmann and Bödecker, we find it an object worthy of worship.

In this connection, Dr. Atkinson's active interests were almost unbounded, for he found in the "grand man," as he termed him (Heitzmann), a co-worker whom he had hardly hoped to discover. In him he recognized the "missing link" that he had so longed for in his chain of personal observation and investigation, and no one better knows than myself the ardor that he applied in forming the first classes for microscopical study of the "morphology of tissues" in Heitzmann's laboratory.

No child was ever more enthusiastic over a new toy than Dr. Atkinson in that first class. We can hear him now exclaiming as each beautiful new definition was shown under the lens and so intelligently explained by the professor. He, too, caught the childish glee and carried no little of it into the spirit of his teachings; and why not? He had never known such cordial acknowledgment, and it became such an inspiration as he had never before met. With this work has dawned upon our calling a true scientific sky, and, true to the last, Dr. Atkinson, in the last speech he made before the Odontological Society eulogized Heitzmann's reticulum theory. It was a tribute from a dying hero to a living hero in science. Dr. Atkinson has often said this work of Heitzmann's settles the question of a sure scientific foundation for our calling. This has crystallized into a concrete practice, which he had seen in his inspirations; and now they are ours in pages of books to remain. All honor to him who was permitted to see his desires realized. Who can say that Dr. Atkinson's life was a failure? Weak men have emphasized it, and, more, there are those right here in New York that disgrace themselves by defaming his memory. Shame! shame! that men can so degrade themselves.

In no one field have the teachings of Dr. Atkinson been more pre-eminently practical than in surgery. By his example he has reduced much of what had formerly become major surgery to minor surgery. His views were antagonistic to what was termed the "expectant treatment." For instance, if necrosis was manifested, nothing was thought of being done to conserve the parts, "but it must be left for the system to deal with it, trusting that a sequestrum would be the result." What may be called minor dealings in a wide range of lesions have been established as surgery in the chair, and robbed of its terrors. It is no longer an assumption to say that in a dental chair operations are daily performed that are of incalculable service to humanity, and thus we are elevated in the scientific estimation, and the importance of our profession is magnified.

In the next quarter of the century the rightly-educated practitioner will be in demand to a degree as never before. This new departure in teaching has enhanced the possibilities of our usefulness that should create a fervor that will do honor to the memory of him who has been inspired to make it possible.

If I refer to the remunerative advancement this advanced field of labor has produced, it will be more seen in a practical sense. Surgery by one that is properly educated commands an attention and a fee that thirty years ago were not known or thought of. This class of service is doing away with "jobs," and an intelligent public are finding out that sickness of tissues is not to be corrected in that way. And we may ultimately hope to see the time when it will no longer be rung in our ears, "What do you charge?" but the first thought will be, Is he skilful?

At no time in our history has there been more serious thought for the future good of our calling, and we all agree that we think it timely that it is so. The *Ohio Dental Journal* has recently asked a question that should have our wisest consideration. Why do so few young practitioners attend society meetings? This question should not only be asked by all thoughtful practitioners, but it should become the business of all to give it earnest study and find out why, and set about seeing that it is corrected. It will be of value to study the age in which we are living. Dr. Morgan Howe said not long since, at one of the meetings of the Odontological Society, that it seemed to him that too many of our young practitioners were manifesting too large an interest in the financial part of practice. There will be those that will say that in this they think they are wise. Financial interests are not to be ignored by any means, but an over-attention in this direction will work ill to the best interests of our calling.

Close readers of the journals have noticed that some have discussed finances, and have originated the idea that more money is to be made in some other calling. True, this may be. How comes this? Those that are saying these things are reputed as moneyed men; some of the same men are congratulating themselves that their sons have not joined the ranks of dentists. We do not wish to try and analyze the meaning of such statements, even if we could.

Every year makes it more apparent that our calling is of no mean character, and one that is to call for a standard of ability which will demand investigations, aided by energetic and scientific co-laborers, equal to any other calling, and I do not think I over-

estimate the true situation when I say that to meet the demand it will require men fitted with an education of hand and head, and I may rightly add heart, without which no calling of need is worthily followed to the uttermost. Professor Miller has not emphasized the importance of our work too highly in the beginning of his late article in the *Dental Cosmos*. The mouth, our field, is far from being thoroughly understood. We are but upon the threshold of a scientific survey of its real needs. The only real scientific knowledge we have of it is the minute anatomy of the teeth. Of the fluids that are associated with their internal and external conditions we know little or nothing, and possess but an empirical sense of their action and reaction, of the changes that are occurring from time to time, and that these are liable to take place by sudden environments that come and bring serious results to the structural character of the teeth and their allied tissues.

What is our knowledge of the waste of the external portions of teeth which we term erosion and abrasion? Are they one and the same? What is our knowledge of the most serious and destructive conditions that we are witnessing daily, so-called "Riggs's disease" and "pyorrhœa"? Who are the ones to give us the true etiology of these disorders?

Let those who treat lightly scientific investigations answer these questions, if they have the brain. In the light of these queries, let him that has a particular gift apply himself to it with an arduous devotion, and each respect the zeal of the other and vie with each for a place in the front ranks. Such opportunities as are offered to young practitioners in our calling, in our estimation, are rare. To aim high means a purpose to attain to things above the ordinary. It is in our thought to be able to stimulate mental action in the direction of magnifying the importance of our work. We have large faith in the future of our advancement to a position that will ultimately place us beside the more exalted. For this, the late Dr. Atkinson zealously labored and spent himself to the end of his career. In the last few months his very earnest thought dwelt upon the subject of adenoid growths. It was his daily study to add a new knowledge to the subject so little understood from an etiological view. Had he remained with us until the May meeting of the Amerian Medical Association he would have presented us a valuable consensus of his thoughts upon the subject.

Many times has it been remarked as strange that he had never given us a text-book of any kind, and often has he been heard to say "he was glad that he had never fallen into such a folly."

Dr. Atkinson's work was to inspire men to thought formed upon basal principles. He often grieved at the lack among his fellows of mental philosophy. But he did not go from among us without a lively feeling of encouragement that he saw a better prospect for the coming days. It was often repeated in our hearing, "the boys are growing; they are getting a grasp of things that will not permit of the domination of ignorance as in the past." The new school of practice calls for this class of thinking. Our thinking must be on the basis of mental philosophy to have it intellectual. It is coming to be a lamentable fact, and it is the cause of much intelligent discussion that is recorded in our monthly literature. If our discussions were so formed as to show how men arrived at their conclusions, this great error, so common, would soon be corrected; until it is, it will be a serious hinderance to our advancement.

Men cannot deal with surgery on the basis they do with mechanics. It demands a grade of mental action that must be intelligently associated with intuition,—possibly psychology may better express my meaning. It may often occur that a good mechanic may be destitute of this higher quality of ability. That it may be cultivated, I think, is true, yet it is in larger ability an inheritance or gift. So it may be that one will be largely qualified in the latter quality and largely deficient in the former. At this point of thinking some will inquire, How can we ever hope to make a practical division of our calling? All along these lines of thought are open fields for emphasizing its importance.

We can, under the inspiration of this subject, put our minds into active research for examples that tell us that there has been a quality of intellect working in this direction, and we are to see more of it,—such bright intellects as the author who wrote that unanswerable article for the *Dental Cosmos* on the ethics of law (and the late Dr. James White honored it with an editorial), Thompson, of Topeka, Kansas; Talbot, of Chicago; Ingersoll, Kingsley, Andrews, Bödecker, J. L. Williams, now of London, Barrett, and others. The labor of these men is forming a composite without which no lasting foundation could be formed, and in the same line all of our brilliant practical workers are nobly filling a niche of no mean importance. Also, every earnest, sincere laborer is a valuable contribution, however humble he may think himself to be. Work for all, only work while it is day; here a little and there a little, carrying each day the ambition a degree higher than yesterday. In this way, more and more will our work be emphasized. And, lastly, our

prime thought must be to be of use in its highest sense and to those we are called to serve. In this way we will answer the question, and in the most emphatic and practical manner, How can we educate the people? The response will be, Take our highest standard for those in need as they come to each one of us day by day,—not those of our neighbor, but those that divinely seek us for that which we have been sent to do. Whose professional character can we more profitably photograph upon our daily mission than that of the noble, heroic, unselfish, fraternal Atkinson? I cannot conceive of a pattern that can prove of so much stimulation to the true professional gentleman. Having been faithful to the light we have had bestowed upon us, we will be able to say at the close of an active, useful, humane mission, *Exegi monumentum ære perennius.*

ANTI-CONSERVATIVE TREATMENT OF EXPOSED DENTAL PULP.[1]

BY CHARLES HARKER, D.D.S.

The title of my paper makes clear the fact that, with me, the method of treating exposed pulps is the radical one. To this method I was driven by my almost universal failure in pulp-capping and palliative treatment previous to the last five years.

During this period I have devitalized more than ninety-five per cent. of all exposures presenting in practice, with no per cent., so far as I know, of failures to record.

If, therefore, I have been successful in any department of practice, it is with these most difficult and perplexing cases; and if I can convey intelligently this anti-conservative method to one young operator, sparing him and his patients my early failures, I shall feel more than repaid for my endeavors.

I say most difficult and perplexing, although, if we read over the articles on conservative treatment which have appeared in dental journals during the last decade, we might conclude that the dental pulp is the most manageable and accommodating of vital tissues.

I am well aware that I shall be arraigned by the able conserva-

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[1] Abstract of a paper read at the joint meeting of the Pennsylvania and New Jersey State Dental Societies, July 20, 21, 22, 1892.

tive advocates present, for my so-called wholesale destruction of vital organs; but, be this as it may, I must state my convictions, based as they are upon my own experience.

When I state that I devitalize ninety-five per cent. of all exposed pulps, with no per cent. of failures, I do not wish to be understood as claiming immunity from trouble subsequent to devitalization, extirpation, and root-filling. Teeth having abnormally-formed or compressed roots, constrictions, nodules of dentine in canals, pulp-stones, etc., present difficulties not insurmountable, but requiring skill and patience for their successful treatment.

In my practice, in less than one per cent. of the teeth operated upon has irritation occurred of a nature serious enough to require removal of the permanent filling; and in these exceptional cases subsequent treatment has resulted in restoration to comfort and usefulness. In no one do I recollect an abscess having formed subsequent to root-filling, followed by extirpation of the pulp.

On the other hand, my experience in capping the fully-exposed pulp, due to extensive caries, has been almost always followed by pain to the patient and trouble to myself or my neighbor-dentist, with disaster to the tooth within two years unless the pulp was promptly devitalized, removed, and the root-canal properly filled. I say disaster to the tooth, because when the tooth is left to absorb the putrescent products of a decomposed pulp, the tissue itself suffers irreparable injury, not only in appearance but structurally as well. The dental tubuli having become saturated with the gaseous and sanious products of decomposition, the basal structure altered, the enamel discolored, checked, and brittle, a tooth is presented unwholesome to its surroundings and infinitely inferior in strength and comeliness to the one where the exposed pulp has been extirpated at sight or devitalized by the usual process, extracted, and the subsequent operations of root- and crown-filling completed properly and at the right time. The strength, color, or structure of the tooth is but slightly altered.

I have two teeth in my own mouth the pulps of which were devitalized, the roots filled with creosoted cotton, the crowns with amalgam, about twenty-two years ago, by my preceptor, Dr. Brown. After the lapse of twelve years the fillings were removed and the cavities refilled; until this time I did not know the pulps had been devitalized, and, with the exception of a little peridental irritation of one at the time, due to the unnecessary removal of root-filling to substitute a solid one at the apex (in most cases a bad practice), the teeth and surroundings have been perfectly healthful and useful.

They appear to be good for at least a score more years of active service.

I could give instances of teeth having been treated likewise, in which more than forty years of uninterrupted health and usefulness have been enjoyed.

Notwithstanding cases similar to these frequently come under our observation, I do not claim that pulps should never be capped. In traumatic cases, where the excavator has accidentally punctured the peridental membrane, or where fracture has occurred, slightly exposing the pulp, capping should be practised; especially as cases of this nature are usually the most favorable.

No one, I think, is more careful than the speaker about lining deep cavities in teeth whose pulps are not exposed. Magitot, in his treatise on dental caries, not only tells us, but clearly demonstrates, by beautifully executed cuts, the pulp complications where no exposure, or even near approach to it, exists.

Capping with oxyphosphate or oxychloride, to which is added about one part of carbolated vaseline to ten parts of the oxide, I believe conduces very materially to conservation of the pulp's vitality; and yet, more or less frequently, we all have pulps to die when capped under these most favorable circumstances.

Whether the loss of vitality is to be attributed to the continued irritation due to previous caries, the impingement of secondary dentine, thermal changes, the taking of cold, or what not, the result is the same; proving that, instead of being easily manageable, a tooth-pulp is so treacherous that we can never predict with certainty the results of capping.

This operation is based upon a most beautiful theory: there are many beautiful theories that do not work well in practice. I have always been in the habit (it may be a bad one) of uncapping all capped pulps coming from the hands of other dentists; that is, when refilling has become necessary, or disease is apparent. In this way I gain certain knowledge of the conditions present at the time of my operation which, it seems to me, can be gained in no other way. In almost every case in which the tooth has remained comfortable I find no real exposure exists nor ever did exist.

A small per cent. of these, however, have quietly succumbed, especially those in which the regular oxy-phosphate mixture has been used. Cases in which real exposure existed at the time of capping I have usually, although not always, found dead. When alive they appear, as they did before the capping, more or less diseased, but apparently resisting progressive diseased action while

the vital forces are strong in the individual, but ready, whenever systemic changes occur reducing vital force, to develop a local inflammatory condition, resulting in death.

I am aware those who advocate conservative treatment claim, by properly-directed antiphlogistic measures, to be able to allay all irritability; but to my mind the treatment of an inflamed tooth-pulp by leeching, cold application, purges, etc., while the irritant (the plug) remains *in situ*, is too absurd to need comment.

I have yet to find the first instance of a previously exposed pulp due to caries having itself after capping wrought out physiologically the theory which the capping process promises, or rather, I should say, the result which the conservative advocate promises for the theory. That this physiological deposit ever takes place after caries has caused a rupture of the pulp-membrane, is still a question. No one, I think, would assert that the pulp ever does return to a perfectly healthful normal condition. That it may do so after exposure due to traumatic cause, is more reasonable to suppose.

In my experience, the membrane when ruptured by caries does not heal at all; when uncapped, it always presents a raw surface. I have, however, in a number of instances accidentally punctured the pulp in excavating, and, having capped and filled with cement, after the lapse of one year or more, upon uncapping I have found no exposure existed, calcified matter having formed under my cap. Underneath the calcified deposit I have no doubt cicatricial tissue had formed.

In the case of a girl, ten years of age, who had, by a fall, broken off the mesial corner of a superior central incisor, exposing pulp, so as to bleed slightly, I at once capped and built out to the original contour with gold. Five years afterwards, while playing at school, she again fell, breaking away the entire filling. Upon removing the cap, I found this pulp beautifully protected by a secondary deposit of well-formed tooth-bone.

This case, though interesting to study, does not come under conservative treatment in the usual acceptation of the term. I merely cite it to show the distinction, and also to show that we must have the ruptured membrane re-formed before we can have its function. Experience proves that after rupture by caries it does not re-form; it cannot, therefore, produce the secondary deposit claimed by the conservative advocate.

Since this paper has been in the course of preparation, one of these patients has visited my office, in whose lower jaw I found six dead teeth, which had been well and scientifically capped by an

eminent Philadelphia dentist. Another had been treated in whose mouth I found three suppurating abscesses, with another tooth in the incipient stage, the results of well-capped pulps. I might enumerate cases which are striking illustrations of disaster resulting from unwise but well-meaning endeavors at pulp-conservation on the part of otherwise successful practitioners.

I do not believe with some that the whole office of a tooth-pulp has been performed when it has finished the construction of the tooth in which it is located; on the contrary, I hold that its function never ceases while it is in comparative health.

It continues to nourish the dentine, and under some circumstances to elaborate secondary dentine, notably when the pulp is being encroached upon, owing to mechanical or chemico-mechanical abrasion, and when caries is threatening exposure. I do not, therefore, wish, nor would I dare to claim, that a dead tooth is as good as a live one, other things being equal. I believe I practise conservative treatment of teeth by non-conservative treatment of the diseased pulp.

Is this not good surgery? In the practice of general surgery, does the surgeon hesitate to destroy the diseased part of an organ, if thereby the function of the whole may be preserved? Should we, then, as special surgeons, hesitate, especially as we, unlike them, are able to substitute artificially the lost part so perfectly that our patient feels, sees, or knows no loss?

The operations involved in dealing with exposed pulps, whether by extirpation or capping, call for skill and nicety; careless or indifferent operations will fail in the former sometimes, in the latter always.

Indeed, upon the exercise of judgment and skill in this department depends very largely the number of our patients; it is vital to our success. How, then, shall we treat them? Two methods are open,—palliative and radical. Upon the former I have dwelt sufficiently long; the latter I will now endeavor briefly to describe as I practise it. There may be nothing new or superior in it, but when thoroughly performed it is successful.

The teeth do not to any extent check, chip, break, discolor, or give other annoyance to patient or dentist. The models which I will pass may assist me in showing the partial and completed operations.

The plug is removed, or, if a fresh exposure, place over the exposed portion of the pulp pure carbolic acid for about two minutes, then, covering with sandarac and cotton, dismiss until the next day;

at which sitting the previous medicament is removed, and the arsenious acid applied directly to the exposure, sealing again with sandarac and cotton.

I request the patient to call on the fourth day, when the arsenic is removed, the pulp entirely uncovered, and a portion excised, bleeding it freely to prevent pinking of tooth during the waiting time, about three weeks, while nature is deciding how much of the pulp she will give up. I then place in the pulp-chamber a piece of dry absorbent cotton, carrying as much as it will of iodoform powder, the piece of cotton being large enough to fill the pulp-chamber.

The cavity is then filled with a temporary gutta-percha stopping until the final operation, when I place dam upon the tooth, and extract pulp from root or roots. With No. 7 or 8 uncut Swiss broach having a perfect taper point I work a mixture of campho-phenique, iodoform, and zinc oxide to apex, following with a tiny fibre of cotton, carried as nearly to the point as the previous mixture will allow without painful pressure.

This procedure insures carrying a bland sterilizing apical stopping entirely to the so-called "apical space,"—that is, to the border-line separating devitalized dentine from living cementum and its investing membrane.

Removing with a broach the fibre of cotton, and drying the canal as thoroughly as possible, the remainder of the canal, when of normal calibre and formation, is filled with a gutta-percha cone made to fit the canal, the point of the cone having been moistened with chloroform previous to introduction.

The apical portion in two-rooted bicuspids, compressed anterior root of lower molars, and other tortuous or constricted canals, may, by using No. 7 slender Swiss broaches, usually be well filled either with the antiseptic material I have indicated or with chloro-gutta-percha.

Except for the removal of adherent and other calcific deposits, I never ream canals more than may be done with ordinary bud-shaped excavating burrs; canals which may not be reamed without great danger of going through the side of the root or breaking off the reamer, may be well filled without reaming. Nicely-tempered slender broaches adapt themselves without danger of breaking; reamers do not.

There is a field for the exercise of judgment in removing or overcoming the occasional difficulties of the apical territory, which perhaps no written description would cover, but which the cultivated

judgment and touch, together with delicately-formed and properly-tempered instruments, will enable us to surmount with comparative ease.

Some of these exceptional conditions would have caused trouble, and ultimately death, had the pulp been capped and the capping operation itself been successful.

I do not remember ever having heard mentioned the method of approach which I use in dental exposures of lower molars, and would call attention to it, knowing from practical experience that by cutting away the posterior buccal corner as far as the buccal seam, instead of the usual drilling of a hole through the buccal wall, our light, line of vision, directness of approach, and movements of instruments are less obstructed.

I think you will also agree with me that, in addition to facilitating the whole operation, a tooth thus prepared is stronger than when filled in the usual way.

Let me say that if the arsenic has been well triturated, the proper dose used, the nerve well exposed before applying, the sandarac bottle warmed before using, and no pressure made upon the pulp in sealing up, there will very rarely be any pain from the application, and no danger from the effect of arsenic upon external peridental membrane, either about the apex or gingival margin.

In case the effect has not reached through the whole extent of the pulp, I remove the portion devitalized, re-apply a minute quantity of paste,—one part arsenious acid to ten parts iodoform, moistened with campho-phenique,—or anæsthetize locally with cocaine, and remove.

I much prefer removing the entire pulp to the apical constriction, but, if unable to do so, no harm will come from leaving in the canal the slender apical fifth of pulp, whether dead or alive, provided the antiseptic filling I have recommended be well picked into it; if not dead, it will die, and make a fairly good apical filling. When trouble follows devitalization, it is from one of two causes,—either peridental irritation arising from an overdose of arsenic, or ultimate disintegration and evolution into septic gases of unsterilized, shred-like portions of the pulp remaining in the inaccessible portions of tortuous or constricted root-canals. In my experience the former difficulty rarely occurs, and always subsides in a few days without treatment. I have already referred to the infrequency of the latter; when it does occur it is of more serious nature, but its consideration would take us into the treatment of incipient abscess, a discussion beyond the legitimate compass of my paper.

A CASE.[1]

BY CHARLES B. ATKINSON, D.D.S., NEW YORK.

A RECENT case has interesting features, although it is unfortunate that it is not uncommon in this day of great opportunity for the acquirement of general professional ability.

February 17, 1892, a female, eighteen years of age, of lymphatic temperament, several carious teeth, as noted later, chronic incontinence of urine as a sequel of scarlet fever, and a general hyperæsthetic condition of the mucous membrane, presented with considerable swelling over the left side of the face, especially prominent opposite the site of the left superior first molar, extending backward and downward to a point near the lower border of the inferior maxilla, posterior to the site of the left inferior second molar, and having a poultice of soap and sugar about the size of a silver dollar placed about the latter point. The skin was greatly inflamed under and about this poultice, and extremely thin, and threatening to slough through momentarily. On removing the poultice (which was at once ordered off permanently) a fistulous opening was disclosed, which discharged serous fluid. A probe demonstrated soft tissue in all directions, bleeding freely on slight pressure of the probe.

No abnormal growth of any kind was present. This swelling at the angle of the jaw on direct pressure produced a sensation of a hard growth at the angle, but traction on the skin anteriorly and posteriorly permitted a clear definition of the normal maxilla, and plainly disclosed the hardness to be confined to the soft tissue and entirely due to the inflammation about the fistula (*caused by the poultice*).

Examination of the interior of the mouth showed the absence of the superior centrals, carious left superior cuspid, first and second bicuspid, and first molar crown absent with its three roots separated, anterior buccal root very loose, great gingival hypertrophy, bleeding on slightest pressure, with extensive swelling on the buccal aspect of the gum back to the condyle. The left superior second molar carious, and left superior third molar also carious in the crown, erupting outwardly and posteriorly, and impinging on the ramus at each closure of the jaw to such an extent as to cause considerable pain.

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[1] Read before the California State Dental Association, July, 1892.

The mucous membrane covering the ramus at this point was quite inflamed and considerably swelled.

The left inferior third molar was carious in the crown (or, as Dr. Kirk suggests, contained a "morsal" cavity). The left inferior first molar was absent, having been extracted (?) March, 1891. The left inferior second molar absent.

A small abscess pointed opposite the site of the posterior root of the left inferior second molar, on the buccal aspect of the inferior maxilla, with slight swelling.

Pressure about this point caused a slight exudate of this pus, and the finger being carried over the apparently healthy gum between the left inferior bicuspid and third molar demonstrated a sharp, pricking sensation, irregularly marked along the buccal border of the space from which the left inferior first and second molars had been removed.

Diagnosis.—Fractured buccal wall of the alveolus of the left inferior first molar, which had become carious.

Inferior external swelling sympathetic (poultice, wanton interference).

Superior external swelling due to the impinging of the left superior third molar (erupting) against the ramus. These swellings aggravated, and, in a measure, joined to produce, a pendulous enlargement of the left side of the face by the œdema from inflammation about the roots of the left superior first molar.

Treatment.—The poultice was discontinued at once, as stated.

The external swelling was coated with contractile collodion.

The loose anterior root of the left superior first molar was removed.

A U-bolt was fitted to the posterior buccal and palatal roots, and a porcelain crown set thereon, the hypertrophied gum having been thoroughly excised and burned with pure carbolic acid. The bite was slightly opened by filling with cement to form an abnormal crown on the left superior second molar.

A filling of cement was placed in the left superior third molar, so as to occlude upon an inclined plane with the posterior edge of the left inferior second molar, diverting the erupting superior third molar forwardly and inwardly, and prolonging the buccal face with a rounded, smooth surface, against which the ramus could play without inconvenience.

The gum between the left inferior second bicuspid and third molar was laid open, and the carious alveolus removed with a bone burr in the engine.

This line of treatment proceeded from February 17, 1892, until March 16, 1892, when the case had assumed a normal appearance and feeling: it is now being fitted with bridges and permanent fillings.

From the following history of this case, previous to its presentation to the writer, some grave conclusions may be drawn, and it was the special nature of its history which urged its presentation before you. In the writer's experience it is by no means an isolated example of hasty diagnosis with unfortunate results. In this instance a comely young woman sustains a cicatrix needlessly; although by constant anointing with lanolin and persistent manipulation the scar has already been drawn down under the border of the inferior maxilla (a distance of at least three-fourths of an inch from its original site), and although it will be small and not readily noticed, still it will be a life-long scar. In addition to this is the year (nearly) of needless physical and mental suffering, with the systemic exhaustion the continual urge to suppuration induced.

History.—The left inferior first molar was extracted (?) in the latter part of March, 1891, under nitrous oxide. In about two weeks the left side of the face began to swell. The family physician was called in, who said he feared an abscess, although he hoped it would not be of the bone. On further examination he said the left inferior second molar had abscessed, and advised extraction. The patient consulted a dentist, but her naturally flabby tissue had become so tense from the serous infiltration that the dentist could not gain access to the tooth. Another call in a week resulted likewise.

July 1 (three months after the first extraction) six teeth were removed, including the abscessed left inferior second molar.

July 4 the physician was again called, and diagnosticated the (sympathetic) external swelling as an abscess and ordered a flaxseed *poultice!*

This poultice was continued until August 1 (a month), when the swelling was lanced, and the contents proved to be chiefly blood. The poultice was continued for three weeks, and again the lance was plunged into the patient's cheek.

The flaxseed poultice was then replaced with one of soap and sugar. The hard swelling and the before-mentioned neighborhood enlargements continued. The patient visited the country in the last week of August, where she consulted a surgeon in a hospital, who diagnosticated a bone tumor, the traumatic removal of which

would probably result fatally, and advised its removal by injection. This operation was declined.

From September, 1891, until February, 1892, the soap and sugar continued its fell work of softening and thinning the skin beneath the plaster, until the case presented to the writer, February 17, 1892, with the results stated.

HINTS WORTH REMEMBERING.

BY GEO. A. MAXFIELD, D.D.S.

To remove the stains of tincture of iodine, from either the hands or napkins, apply strong ammonia. The spots will immediately come out clear.

The stains of nitrate of silver, from either the hands or napkins, can be easily removed. First cover the spots with tincture of iodine, wait a few moments, then apply strong ammonia, and rub well.

In using argenti nitras in treating children's teeth one may accidentally get a few grains of the powder on his hands and not discover it till the hands are washed, when the black stains will be well set. By proceeding as above, they will disappear at once.

Reports of Society Meetings.

AMERICAN DENTAL ASSOCIATION.

First Day.—Evening Session.

(Continued from page 764.)

Dr. Brophy.—The next matter on our programme will be the presentation of a case by Dr. Cryer, of Philadelphia, on a new operation for the excision of the inferior dental nerve.

Dr. Cryer.—I wish to report a case of the dissection of the inferior dental nerve, which I think is new. We have many operations for this nerve, and, as I have no models here, I cut out this

piece of pasteboard to represent the jaw. [Illustrating.] On the inside of the jaw we have the inferior dental foramen; on the outside the mental foramen, and from that the canal known as the inferior dental canal, in which pass the inferior dental nerve and the artery; also the canal known as the mylo-hyoid canal, which accommodates the artery and the nerve of the same name. In neuralgia of the mouth and lower jaw, this nerve has been torn out in various ways, an operation, I have no doubt, the members of the Association are acquainted with. By opening the cheek and turning it up, the canal can be reached. By drilling or taking a piece of bone from this the nerve has been drawn from the anterior and from the posterior portion, taking out as much as possible. Another operation is dividing the masseter muscle and trephining, making a round opening, and taking out the nerve; but that has failed very often on account of the nerve getting into the floor of the mouth, which requires that the nerve shall be cut at the bifurcation. Operations by the late Dr. Joseph Pancoast have been to remove the coronoid process entirely; of course that will destroy the use of the temporal muscle, because it will never unite again. It was also found that the cushion of fat which lies under the cheek is often in the way. It was suggested, two years ago, in the Hospital of Oral Surgery, instead of cutting away the coronoid process, to take out the base of the sigmoid notch,—in other words, to deepen it. An opening is made on the face, over the masseter muscle, avoiding the duct of Steno. If that is cut, there may be trouble. Turn the flap upward, and, having it held by an assistant, cut into the ramus of the jaw, using a Kirk chisel, or any instrument with which you can scrape the periosteum off the bone. It can be done with a saw, but that is crude. Take a spear-pointed drill, not a very sharp one, and perforate this full of holes, just as I take these scissors, and then by using a large fissure-burr, intended for surgical work, cut this portion out, which I will illustrate by doing it with the pair of scissors. Operating under antiseptics, it is well to have a bottle suspended four or five feet above, and by adding a tube the flow can be controlled by pressing on the nozzle. Let this run on the burr as it works. That will clear the chips away, and a clear view will be obtained just beyond the instrument. When the nerve, artery, and vein are struck, it will be known. The burr will rub against these without injuring them, and when the centre of the bone is reached you are opposite the foramen. If satisfied thus far with the operation, the nerve is separated from the vessels. It is best not to destroy these, on account of possible hemorrhage. By

using forceps with a gauge, the nerve can be seized and the instrument will retain its hold. The mylo-hyoid nerve runs in this direction. Take as much of it out as possible. It is said that it can be pulled out. I do not think it can, because the force is drawing against every fibre that goes up into the different teeth, and the result will be that it will be broken. If broken, it has been pulled out and still held in the forceps. Perhaps an inch of the nerve is out, including the mylo-hyoid nerve. As the assistant holds this, take an instrument with a hook on it, and push it up towards the base of the brain, under the external pterygoid muscle. Push it along as far as possible, and then cut it off.

Dr. Patrick.—I would like to ask the gentleman who the surgeon was that advocated the process described to reach the inferior dental nerve.

Dr. Cryer.—I think it was Dr. Pancoast.

Dr. Patrick.—How could you amputate a portion of the ramus and the neck of the condyle under the process without having the zygomatic arch interfere?

Dr. Cryer.—The zygomatic arch did not interfere. It was cut in a direction like this [illustrating], either by a circular saw or the ordinary Hey's saw. A gentleman asked me if this cured neuralgia. The operation has been performed twice,—the first a year ago last March, and the last in March, a year apart. Both patients are entirely well. The first one has a little twinge occasionally in the region of the tip of the tongue, which may come from another nerve, but he is much relieved and very comfortable.

On motion of Dr. Brophy, the courtesy of the floor was extended to practitioners in medicine.

Dr. A. Hoadley.—I have listened to the description of this so-called new operation for the excision of the inferior dental nerve with much interest. There are some new points about it, inasmuch as it contemplates removing the sigmoid notch. Other than that, I do not think there is anything unusual in the operation. It very often happens that when the old operation of trephining over the inferior dental canal is undertaken, the bridge of bone that exists above that is frequently snipped out for the purpose of giving more room and then cutting off the nerve about the mylo-hyoid. Pulling out the inferior dental nerve is sufficient to destroy the function of the nerve. If it is drawn out from the inferior dental canal, there will certainly be no further neuralgia from that point. Its peripheral function is destroyed. Should neuralgia continue to exist over

the branches of the nerve, it is positive that the irritation exists higher up, possibly where the nerve passes out of the skull at the foramen ovale.

There is one other point I wish to speak of in regard to the anatomy of the parts. The coronoid process only rises slightly above the sigmoid arch, to which the temporal nerve is attached. It can be cut off far below the arch, and it can be united, after having been divided, with excellent prospects of union. If I remember rightly, the gentleman who described the operation stated that it was objectionable to divide the coronoid process, but, if I am not mistaken, if good apposition is made and the fragments secured by suture, a good union is accomplished. In fractures of the under jaw union is made without difficulty. It is a bone that unites, as a rule, under almost any circumstances, but once in a while a diseased process will give some trouble by perhaps interfering more with nutrition than with the factor of non-union. The operation is one that is extremely simple. It is not attended with any danger, and it can be performed exactly according to the methods laid down by the gentleman who described them; the nerve can be cut off a little higher up by this method than by the old one of trephining; but the difference at the point of the upper part of the mylo-hyoid and the upper part of the sigmoid arch does not make any change in neuralgia. The difference between the division of the mylo-hyoid and the highest point described by the gentleman would be of little consequence in the curative effect of the operation. I thank you for the privilege of speaking.

Dr. Morris.—I am very much surprised to see this subject brought up in the form of an unpleasant operation from the outside, when we have the method which was first introduced by Professor Hutchins, of using the dental drill on the superior surface of the dental arch, making two or often only one cut through the upper part of the jaw-bone, down upon this canal, cutting it off at any desired point, and not making a wound upon the external surface larger than a quarter of an inch, and giving as much relief as any of these surgical operations have ever afforded. I cannot understand why this method is not more extensively used by the dental profession. It was given to the public by Professor Hutchins about 1875. I furnished the dental drills that were used with the method. Professor Hutchins was the first one to use it, and now the old method is preferred, making unsightly scars.

Dr. Fillebrown.—I do not make any wound on the external surface. It seems to me that, as there is not one case in a hundred

that proves a permanent cure, it is hardly worth while to go to such an extensive disfiguration of a patient as opening from the outside of the face. It is possible to remove it within a quarter of an inch of the point of the operation described, and all within the mouth. I have a patient who to-day has the inferior dental nerve removed from the second inferior bicuspid, which is still in the mouth, to almost three-quarters of an inch beyond the foramen, where the nerve enters the inside of the jaw. She suffered with neuralgia. I trephined and removed three-quarters of an inch back of the second bicuspid. She was well for a year and a half. Soon after that she came, and I performed another operation. I cut back through the canal, and took it all out right into the soft tissue. She afterwards insisted that I should go farther, and, although there was not much hope, I did it to please her. The second operation cured her for six months. The last operation did very little good, and to-day she suffers very much. The trouble is central where the nerve emerges, or it may be still more central than that. The point I wanted to make is, that to remove the nerve almost to the foramen it is entirely unnecessary to disfigure the exterior of the face, but it may be done readily through the mouth.

Dr. Brophy.—I have never had occasion so far to make an external incision for the removal of the inferior dental nerve. The operation of removing the dental nerve within the mouth I think can be accomplished in every case where the operator may be successful in approaching the posterior surface of the second molar for the insertion of a filling. The operation which Dr. Cryer describes is a new one, but it seems to me that the external incisions may be avoided, and should be avoided where it is possible to do so. If we had to go to the centre, to the base of the brain, for the purpose of dividing the nerve, it would be necessary to make an external incision; but to proceed in such a way as to prevent the neuralgia from recurring, is to remove the inner portion of the canal, so as to induce an exudation which will fill it, and this we may do with a strong drill, carrying it backward along the canal and arch, seize the nerve with the forceps, and draw it down to a point where we may be able to hold it. If we do this, and then ream out the canal, and keep it cleansed antiseptically, in a short time it will be filled with new tissue, and the neuralgia consequently will not recur. The old operation of seizing the nerve by carrying it backward and moving it forward may be done, and the nerve divided in that manner; but the danger of hemorrhage should cause a hesitation to

perform this latter. I think it is always well to first make the operation within the mouth, and then, if we find it necessary to extend it further, the external incision should be made as a last resort.

Dr. Cryer.—I hope those present will not think that the gentleman with whom I am associated in surgical procedures would undertake this operation for neuralgia of the lower jaw without first testing some of the minor operations: he would not think of cutting into the cheek until the others had been tried. We all know that after the removal of even two inches of nerve there will be a union of that nerve. In my own body I have had two and a half inches of nerve removed and the rest united, and I have seen canals by more than one surgeon cleaned from the mental foramen as far back as it is possible to go and the nerve removed, and in a very short time the neuralgia returned. One of the gentlemen spoke of taking a tenaculum and passing it in at the inferior dental foramen on the inside, catching it there, and drawing the nerve out and cutting it. That is a very nice operation; but the mouth has to be propped open, the patient must receive ether through the mouth, the sponges and the napkin are in the way, and you have arteries in that region that are very dangerous when cut. I assisted at one of those operations, and we had a serious time to save the patient's life. I do not know which artery was cut. The patient almost choked with blood rushing into the mouth. It was finally checked, but has remained as a warning against undertaking that operation again. You cannot get back and perform it in the mouth; the patient is liable to suffocate, and may bleed to death without showing any external sign.

As late as five years ago, operations on the face made a bad scar. To-day these can be made, and in two weeks' time you cannot see a mark. Of course, as I have said before, I would not undertake to do this until the minor ones had failed.

The idea of reporting this case was that it was only new as extending the sigmoid arch, and it opens it immediately above the nerve, and the nerve comes directly in view and can be easily taken hold of. I want to claim the advantage of cutting the nerve off there. Many claim that it is purely a motor nerve coming from the motor branch of the inferior maxilla, but my experience in the last twelve years in hospitals shows me that it is best to destroy the nerve and to remove as much of it as possible. There may be new bone, and if you can get to the ganglion and cut it off, so much the better.

Dr. Alton H. Thompson, of Topeka, Kan., then read a paper, entitled "The Grinding Teeth of the Herbivorous Mammalia," an abstract of which follows:

The molars of the herbivorous mammalia present an interesting and remarkable example of a high degree of specialization. The complex structure of the masticating surface of those teeth is produced by an arrangement of the dental tissues in alternating layers, the different densities of the enamel, dentine, and cementum allowing of different degrees of wearing away, so that an irregular surface is constantly presented for the purpose of triturating resisting vegetable fibre, which is such an important function in the physiological economy of the vegetable-feeders. In use, the enamel, being hardest, stands highest; the dentine, being less dense, stands lower; and the cementum, being softest, stands lowest of all. The molars in the ruminants and all vegetable-feeders are formed as though layers of enamel, dentine, and cementum had been laid upon each other and the whole then rolled and crushed together. This produces a very effective instrument for mastication, and is a highly specialized form of tooth, as we shall notice later. A cross-section of a tooth reveals a pattern which presents a great variety in different species and is of distinct diagnostic value. This pattern differs in different families and in different orders, but is uniform in a species, and is closely related in each genus. By the study of this pattern, naturalists have a means of diagnosticating species, and it is of great value to the palæontologist in the classification of the remains of extinct animals.

The teeth are the most durable of the animal tissues, and form the most constant medium for the identification of fossil remains. In the evolutionary history of the horse, which was so beautifully worked out by our brilliant palæontologists, the testimony of the teeth was necessary for the confirmation of the descent of the species. It is satisfactorily proven that the single-toed horse of to-day is descended from five-, three-, and two-toed ancestors, who had all the characteristics of the horse, even to the molar pattern. So the biological history of other groups has been worked out with more or less certainty, and the teeth have performed an important part in the evidence they have furnished. In the vegetable-feeders the characteristic patterns of the molar teeth have been reliable indications of affinities, on account of their uniformity. As Owen again says: "Different groups of the ungulata, not only orders and genera, but even species, are characterized by the various patterns which result from the various forms, directions, and proportions in

which enamel and cement alternate with dentine in the substance of the crowns of the complex molars."

The most highly specialized group is that of the ruminants, of which Owen says: "In the ruminants the characteristic complexity of the molar teeth is manifested even in the deciduous series, but in the permanent series only by the three posterior teeth of both upper and lower jaws, which are the true molars. The complexity is the result of peculiar folds of deformative capsules, some of which are longitudinal, or project inward from the side of the capsule and form peninsular folds of enamel upon the grinding surface of the teeth, while others depend vertically from the matrix into the body of the tooth, and form islands of enamel when the crown begins to be worn. Of the longitudinal folds, two in the upper true molars are external, broad but shallow, and often sinuous, and one is internal, narrow and deep, and extending quite down the summit of the crown, and decreasing in depth towards the end of the crown. The corresponding folds of enamel in the completed teeth accordingly extend more or less across the teeth from within outward, as the tooth is more or less worn. The crown of the tooth is thus divided into two parts, one in front of the other, the inner side of each lobe being convex, the other concave in a less degree, and usually with a convex prominence in the middle.

"The vertical folds of the capsule, two in number, extend one into each lobe, and in the upper molars are concave towards the outer and convex towards the inner side of the lobe, which is thus divided into semicylindrical lobules with crescentic summits, as seen on a transverse section or on the grinding surface of the tooth. Each lobule consists of a middle bay of dentine, and an outer coat of enamel and thin cement. The midspace between the lobules—the centre of the vertical folds—is filled with cement, and commonly contains portions of vegetable fibre. It is inclosed by a crescentic island of cement, and the whole of the circumference of this complex molar is also invested by a coat of enamel, and this by a layer of cement. Different genera of the ruminants also differ in the depth and sinuosity of the two outer longitudinal folds, and in the depth and complexity of the two vertical folds, which likewise are united in some species by a longer column than in the others."

The origin and evolution of the teeth of the plant-eaters form a most interesting study. Being highly specialized, they have arrived at a high degree of perfection by gradual steps, most of which can be traced in the successive steps furnished by both living and extinct forms. As Professor E. D. Cope says ("Origin of the Types

of the Molar Teeth," etc.): "The simple tubercle may be regarded as the least specialized form of tooth, and the transition from simple to complex teeth is accomplished by the repetition of the type of the simple tooth in different directions.

"Complex teeth, as the tubercular molars, merely exhibit additional lateral tubercles, and sometimes additional longitudinal ones. The former is done in two ways,—*i.e.*, either by the folding of the sides or by the development of tubercles on the crown. Upon this basis are constructed the more complex types of teeth exhibited by the various families of the ungulata and some rodentia. The crowns of the superior molar teeth of the higher mammalia are supported on three roots, two of which are external and the third internal. The corresponding inferior molars are supported on two roots, and are less complex, but those two roots usually support four tubercles, two on each side, while the roots of the superior molars support directly but one each. The crown of the inferior molar is, therefore, more complex than that of the other. It divides the different kinds of molars into special classes, as follows:

"1. The haplodont, in which the crown is undivided and simple, low and obtuse as in the cetacea, or acute as in the carnivora.

"2. The ptychodont type, the crown folded upon the sides, the folds frequently crossing the crown, as in the rodentia.

"3. The bunodont type, the crown supporting tubercles, which are few and opposite or alternating, and may be many and regular. To this class belong the mastodon, man, the bear, the carnivora, and some rodentia.

"4. The lophodont type, the summit of the crown thrown into folds of transverse or longitudinal direction, as in the higher ungulates. It embraces the many types of ungulates, some rodentia, and others.

"The transition between the bunodont or tubercular teeth and the lophodont or folded teeth is very obvious, so as to lead to the belief that the several subdivisions of the lophodonts represent modifications of corresponding types of bunodonts. Intermediate forms are seen, where the tubercles of the mandibular teeth are compressed, while they remain conic.

"Thus the teeth of the hippopotamus, whose molars present four principal tubercles, are truly bunodont; the valleys separating the tubercles are deeper than the truly bunodont genera, but much shallower than those of the true lophodonts. In the latter, the valleys are deepened and the tubercles are more compressed and elevated, as in the deer. In the ancient species of deer the crests

are lower and the valleys shallower than in the living species. The lophodont molar was produced by modification of the bunodont, and the manner of the change has been by constant acceleration of the growth of the folds of the crown upward, and perhaps downward in its long axis, and acceleration of the length of the crown."

Or he again says ("The Extinct Mammalia"): "The ordinary tooth of the higher type of the mammalia, whether hoofed or not, with some exceptions, is coupled with crests or cusps. By cutting the complex grinding surfaces we find that they have been derived by the infolding of extensions of four original cusps or tubercles. They have been flattened, have been rendered oblique, have run together, have folded up, have become acute, have descended deeply, or have lifted themselves, so that we have teeth of various kinds, sometimes very elegant, and ofttimes very effective in mechanism. In many primary ungulates the primitive condition of four conical tubercles is found, and in passing to older periods we find the mammalia of the Puerco period, which rarely have more than three principal tubercles. In the succeeding periods, however, they get the fourth tubercle and then others, and finally a complicated grinding or cutting apparatus."

Extensive study has convinced the naturalists and evolutionists of our day that the Lamarckian theory of use and disuse, or, as it is latterly called, the mechanical effects of use, accounts for the principal influence in the development of tooth forms.

Dr. John Ryder, in his article on "The Mechanical Genesis of Tooth Forms" ("Proceedings of the Academy of Natural Sciences," Philadelphia, 1878), has elaborated and described this fully, and shown how the theory accounts most beautifully for the origin and formation of many forms of teeth, and especially of the class we are now studying. He says: "Amongst the ungulata the most conclusive evidence is found of dental modification. The numerous living and extinct forms present a remarkable chain of dental forms, gradually developing from the bunodont type and passing into the exclusively modified selenodont type, acquired by increased mobility of the mandible.

"In elephas and mastodon the jaw movement is from behind forwards: the molars are tuberculate in crown crests, which become obsolete from wear and expose the transverse plates."

The antero-posterior movement has developed the form which offers the greatest resistance to this movement in mastication and consequent efficiency in reducing food. The primitive form of jaw-movement is that of simple opening and closing, as in the typical

carnivora. Next came the backward and forward movement, as in the proboscidæ and other primitive types, and then the lateral movements of the jaw, and finally the extensive triangular excursions of the jaw of the ruminants and other vegetable-feeders, as the highest of all.

"The opening and closing movement is more characteristic of dogs, cats, pigs, hippopotami, bats, opossums, and all other homodonts or their immediate allies. The pigs show the first tendency to lateral movements, and have lengthened crests to oppose this movement of masticating. The tapir presents still more lateral movement, and the kangaroo still more. The rhinoceros describes a much larger excursion, and the ruminants the largest of all. In these the lateral is quite extensive, if not more so than the longitudinal movement. In all these forms there is, of course, corresponding modification of the condyle and glenoid cavity to permit of the typical movement. Indeed, the development of the peculiar movement of each class has modified the articulation as it has the teeth. The forms of teeth result from the strains incident to mastication. Thus, in lepus the strain is upon the inner side of the upper molar, and on the outer surface of the lower molar. This leads to a peculiar straining and curving of the teeth, and a corresponding arrangement of the dental tissues, the recurve pattern of the opposing molar series simulating most closely some of the mechanical devices used by men in grinding-mills."

In cervus the idea of "displacement due to strain" is shown most remarkably. There is some evidence that the premolars are acted upon from the external side as well as from the internal, which tends to keep the jaw narrow at that point. The true molars are, however, acted upon from the inside on the upper jaw, and from the outside on the lower jaw. This tends to spread the jaw at those points, and modify the enamel pattern. The motion being lateral, the strain both on tooth and tissues must be very powerful. In the giraffe, the molar line of the lower series is slightly convex internally, and it has extensive lateral excursion of the mandible. The upper series is convex internally. The displacement seems to be greatest where the masticating muscles act with greatest force. In the rodents there is a reciprocating motion, which counteracts the lateral, so that displacement is not very great. In cervus there are deep transverse valleys and cross-crests, showing the persistence of this arrangement where the mandibular movement is entirely lateral.

"It looks as though the strain incident to mastication had

pressed the cusps of the tooth flat, and curved their cornus outwards in the upper series and inwards in the lower by their oft-repeated excursions in one direction. The flexures are modified in accordance with the various directions of the excursion forces, and the plicate layers of the dentine of the horse, and perhaps of the ox and deer, may be accounted for in the same way. The plication is greatest in a line parallel with the direction of the strain exerted during mastication. Another circumstance is the greater inclination of the inner cusps of the upper molars outwards, and of the outer ones below inwards, which is so common among selenodont ungulates. The mandibular apparatus of mammals may be regarded as a lever of the third class, in which the glenoid cavity is the fulcrum, the maxillary force the power, and the resistance of food to the teeth in crushing the weight. Since the average of muscular force is one hundred and four pounds to the square inch of transverse section, it is easy to surmise what would be the tendency of the force of mastication. It is not all expended in reducing food, but must react upon the structures which are subjected to the strain."

But we cannot follow this interesting study further; enough has been given to show the origin and the method of evolution of the remarkable and complicated structures of the molars of the herbivorous mammals. The great influence dictating this unique formation is food-selection, which is so powerful in modifying the masticating apparatus of animals. In no field is the study of tooth formation and its evolution more interesting than in that of this class, on account of the highly specialized forms that have been developed in obedience to a demand for a more effective apparatus for the reduction of refractory foods.

(To be continued.)

Editorial.

ESSAYS FOR THE COLUMBIAN CONGRESS.

The committee of the World's Columbian Dental Congress having in charge the selection of papers to be read before that body have issued their preliminary circular, which will be found on another page of this number. This, in our opinion, is the most important committee of that congress; for upon it will rest the responsibility for the character of the meeting.

It would be very ill advised to give an opinion in advance of what this committee may or may not do; but some general ideas may not be out of place in this connection. The "stream cannot rise higher than the fountain," and the source, in this case, lies in the dentists who propose to enlighten this body. To them, therefore, a word may be of value, and perhaps be some aid in eliminating prolixity, and thus relieving the committee from a useless waste of time and the writers from a possible rejection of their manuscripts.

The decision as to the acceptance or non-acceptance of an essay we are authorized to state will be mainly based on its scientific value. The sentence in the circular which reads, "Those contributions earliest received will, of course, take precedence," seems to give a different idea, and may possibly lead to the inference that papers are to be selected indiscriminately. This is not to be the rule, and should not be.

This congress will, without doubt, be remarkable in many directions. Numbers are assured, but mere size amounts to but little, and in time will hardly remain even as a memory. Distinguished men from all parts of the world will be at the head and among the active participants, but great men pass away and are forgotten. There is but one thing that can live in a convention of this character, and that is the subject-matter evolved from the combined mental force present in its deliberations and active in its work. This will best be shown in the essays presented and in the discussions. Original scientific matter will continue to exist and cause this World's Dental Congress to be remembered when the men who originated it are forgotten. Platitudes, insipidity, verbiage, all deserve to be strangled in their birth, and hence cannot be expected to pass the criticism of the committee.

It is a well-known fact that those best qualified to perform scientific labor of value in their several lines of thought very generally neglect it. There is a large contingent in the United States who, no doubt, are revolving in their minds original work, but unless forced to see the necessity of beginning the preparation at once will defer it until too late to make it available. As we stated in a former number, now is the time to prepare. The papers must contain original matter in order to command respect. Padding by quotations should be avoided, as the time of the congress is too valuable for anything but the subject in hand. The personal pronoun "I" should cease to be a prominent feature in the arrangement of sentences. These should be confined to the relation of facts. Let the paper be read daily for a week, cutting out all superfluous matter, and finally, after this careful revision, have it type-written into at least three copies.

This convention has a much higher object than merely bringing together men from all parts of the world as an excuse to help build up the great Fair. Dentistry in America will be on trial, and we have invited all the nations to come and see what is really meant by the term "American Dentistry." It has been claimed, and we think justly, that the workers in this profession have made it what it is to-day. It is necessary that this bold assumption should be made good. To do this means something more than will be possible to manifest at Chicago. The examination should cover our whole system of instruction. Our colleges should be visited. The large establishments for the manufacture of dental materials should all be open for inspection. Nothing should be kept secret. Let all doors be swung upon their hinges and the world invited to enter the most protected of inner sanctuaries, if such exist.

The charge has been made repeatedly by our European confrères that, while they are perfectly willing to accord to America—and by this they mean the United States and Canada—the credit of being in the lead in mechanical matters, we are deficient in those things that go to make a profession, theoretical attainments in collateral medical branches. Whether this be true or not, it is fully and honestly believed in the Old World, and the sneer of contempt is not infrequently hurled at us as though we were in the age of scientific childhood. It is not so important to disabuse prejudiced minds as it is to develop a national self-respect, and this can be accomplished only by direct comparison. This privilege will be accorded at this convention as never before, and if not decided in our favor, then we must be satisfied to rest on the

laurels we have earned as most excellent mechanicians and inventors.

The hours that intervene between now and the realization of the work of this congress will be periods of anxiety and labor. To relieve this, in a measure, let every scientist in our calling resolve to do his part to lighten the work of the committee, and aid in making this convention worthy the esteem of all peoples.

Bibliography.

THE ESSENTIALS OF HISTOLOGY, DESCRIPTIVE AND PRACTICAL, FOR THE USE OF STUDENTS. By E. A. Schäfer, F.R.S., Jodrell Professor of Physiology in University College, London, etc. Third edition, revised and enlarged. Lea Brothers & Co.: Philadelphia, 1892.

The fact that this book has reached a third edition is sufficient evidence that it has made a place for itself among the workers in histology. The author says in his preface that it "is written with the object of supplying the student with directions for the microscopical examination of tissues, . . . and intended to serve as an elementary text-book of histology."

The book is divided into forty-five lessons, beginning with the "Use of the Microscope, Examination of Common Objects." Each lesson is preceded by a practical description of the work necessary to bring the various tissues into view, with the reagents required and minute instruction as to their use. These are so clearly made that one with a limited knowledge of the microscope should be able to follow them without the aid of a teacher; but, this not being the intention, they become doubly valuable when superadded to class illustrations.

These directions are followed by a general description of the tissue or tissues under examination.

The portion devoted to the preparation of sections of teeth is not as detailed in statement as in most of the other lessons. It would be impossible to follow the modes prescribed and succeed in securing satisfactory results. Nothing is gained in histological accuracy by advising the student that "it is better to purchase"

the specimens used, as "the preparation is difficult and tedious." This, in our judgment, is not the way to study the tissues of the teeth. What is needed is careful preparations of *perfectly fresh specimens*, and, while the work is tedious, the results will be satisfactory in proportion to the care with which this is done and the shortness of time which is allowed to intervene between extraction and mounting.

The book is worthy of introduction in all colleges possessing a well-equipped histological laboratory.

QUESTIONS AND ANSWERS ON DENTAL PATHOLOGY AND THERAPEUTICS, DENTAL EMBRYOLOGY, HYGIENE, AND CARE OF CHILDREN'S TEETH. By Gustavus North, A.M., D.D.S., Professor of Dental Pathology, etc., U. S. Dental College, Chicago, Ill.

This little book of sixty-eight pages has been prepared, it is presumed, to be an aid to the study of the various subjects named in the title, but exactly why a teacher should regard it in this light it is difficult to determine. All books of this character, it seems to us, lead directly to superficial work, and, while they may aid in cramming certain leading points, inevitably weaken the ability to assimilate scientific facts in their completeness.

The answers to the questions in some instances are, in our opinion, misleading, as, for instance, in the portion devoted to dentition and dental caries.

Foreign Correspondence.

RESPONSE TO DRS. HEITZMANN AND TAFT.

TO THE EDITOR OF THE INTERNATIONAL DENTAL JOURNAL:

SIR,—Will you allow me space for a few words with reference to two of the articles in the September number of your journal? It will be remembered that I read a paper before the First District Dental Society of New York in December, 1885, on "The Development and Minute Anatomy of the Teeth in Health and Disease." At the close of that paper I gave a summary of the arguments in the form of eight definite statements of facts, showing the fallacies of Heitzmann's theories of dentine and enamel formation, together

with the views of retrograde metamorphosis, inflammation of dentine, "return to embryonal condition," etc., involved in those theories. Professors Heitzmann and Abbott were present on that occasion, and endeavored by resorting to specious arguments to draw attention from the force of the arguments and facts which I had presented. Not one of those set forth in this summary has ever been answered. But Professor Heitzmann and his pupils have from time to time serenely repeated these statements, disdaining all the facts against them, with their pet theory advanced from some slightly different point of view. The latest demonstration—the paper referred to above—comes from the pen of the great master himself, and in this article facts which are familiar to every one who has given any serious attention to the microscopic morphology of the teeth are advanced as something new and original, and confirmatory of the "reticular structure theory" of dentine and enamel. Professor Heitzmann says that Bödecker was the first to maintain that dentine has a reticular structure, and that "the positive proof that Bödecker's assumption was correct was furnished much later, in 1887, by William Carr." I imagine that Dr. Carr will not take the matter very much to heart on finding this honor stripped from him, but the fact is, that more than four years before this time I had exhibited, in Heitzmann's laboratory, sections of dentine treated with chloride of gold and acetic acid. Heitzmann was greatly delighted with these specimens, and pronounced them the finest illustrations of the "reticular" theory that he had ever seen. Now, in these specimens there was not a single novel feature. There was nothing that I had not seen hundreds of times before, and no appearance but such as every microscopist is perfectly familiar with. The sections had been cut from near the periphery of the dentine, where it joins the cementum, at which point there is often a fine branching of the dentinal fibrilla. I am not aware that any one has ever denied the existence of such branching or that it occasionally occurs in other parts of the dentine. The point to which I especially wish to call attention is, that no matter what appearance of branching or connection between the canaliculi they may or may not have seen, they have never shown anything *under the microscope or on paper* which can possibly be construed into a confirmation of their theories of the formation of dentine and enamel and the changes which occur in the decay of these tissues. At the same time I would call attention to the very marked difference in appearance of these last illustrations drawn by Professor Heitzmann, and those illustrating Dr. Bödecker's articles in the *Dental Cosmos* for 1878–79, a difference

which the different methods of engraving totally fail to explain. As Dr. Allen very truly remarked, there is nothing shown except the ordinary branching of the canaliculi. I may further say that I can indorse all that Dr. Allen has said about the views of eminent scientific men abroad on this question. The recent important investigations of Mr. J. Howard Mummery, of London, serve to further confirm the fallacies of Heitzmann's teachings.

In Dr. Taft's paper on the use of "high potency" preparations of silica in the treatment of alveolar abscess there is much material for reflection. I long ago passed the age of absolute certainty, and, in the words of our dear old teacher, who has "passed beyond these voices," I no more "cry fool" at the dictum of any one; and yet, although I often learn from a child, I can no longer assent, with the happy, blind faith of childhood, to every proposition placed before me. I know people who seem to be sensible on most questions who profoundly believe that they have shaken hands with the spirit of their grandmother. On the other hand, a friend of mine is very sceptical on the subject of spiritualism, but has unbounded faith in the "Keely motor." Some very scholarly people are convinced that there is great efficacy in "Christian science" as a method of cure; and has not the good bishop of Treves just testified on oath that he witnessed many miracles last year at the exhibition of the "holy coat"? Alas that some of us should find these things an offence to "that noble and most sovereign reason," when there seems so much contentment in believing!

I, too, have had my experiences in homœopathy. I am sorry to say that I once devoted the best part of two years to study and experiment in this field. Decided effects seemed sometimes to result from the use of "high potency" preparations, and great was my faith in the ten-thousandth attenuation of calc. carb., until an unlucky day when I discovered that startling effects seemed sometimes to be produced when only *water* had been administered. But my complete abandonment of the use of high attenuations dates from the time when I discovered that I must either give up this method of treatment or avow my disbelief in the atomic and molecular theories of chemistry. One of the greatest physicists of modern times has given us the extremes between the limits of which we may find the measurement of a molecule of hydrogen.[1] Now, if we begin with a grain of silica, we shall find that long before we have reached the

[1] I am writing this from memory, and must be allowed some small latitude in form of expression.

hundred-thousandth attenuation we have parted with the last remaining molecule of the original substance. But to suppose that silica, or any other substance of like character, can be reduced to a molecular condition by trituration in a mortar, is, of course, too apparent an absurdity for even the most credulous. No substance can in any such way be reduced beyond the point of discovering its smallest particles with a microscope. Any one can, therefore, see on a moment's thought that even before the ten-thousandth decimal attenuation were reached, one portion of the liquid menstruum would hold the last particle, and the other portion would be quite innocent of the wonderful dynamic-power-substance. I wonder if any of the eminent gentlemen who discussed Dr. Taft's paper stopped to consider the meaning of the progressive division of a unit by ten until the hundred-thousandth division be reached? I write a rather fine hand, and I find that the nine ciphers required with the unit to express one billion measure about one inch, as I usually write them. According to this rate of measurement, the denominator of a fraction (having one for its numerator) written to express that part of the original grain of silica remaining when the hundred-thousandth decimal attenuation is reached, would extend something over *nine hundred feet.* In comparison with this, how insignificant seem the awful mathematical calculations with which lecturers on astronomy are fond of paralyzing the minds of their hearers! Dr. Andrews is reported as saying that "the action of homœopathic remedies does not seem at all improbable to those who have prepared microscopical tissues and have noted the effect that minute percentages of reagents have on them." I have had the pleasure of looking at many of Dr. Andrews's beautiful microscopic sections, but I imagine that if the staining had been done with a dye attenuated to the point of Dr. Taft's silica, they would command but little admiration as specimens of microscopical coloring. A drop of almost any staining agent known, mixed with all the water that passes over Niagara Falls in a day, would make a brilliant dye in comparison with the attenuation mentioned. Seriously, the field for legitimate scientific experiment in matters connected with dentistry is so broad, and there is such need for real scientific work, that it seems a pity to waste valuable time in discussing ridiculous impossibilities.

Fraternally yours,

J. Leon Williams.

36 Bruton Street, Berkeley Square, London, W.,
September 23, 1892.

Obituary.

AMERICAN DENTAL ASSOCIATION.

REPORT ON NECROLOGY.

THE following testimonials and resolutions were presented, read, and adopted at the recent meeting of the American Dental Association:

IN MEMORIAM—DR. JOHN ALLEN.

In the dispensation of an all-wise and overruling Providence, Dr. John Allen, of New York, on the 8th day of March, 1892, at the age of eighty-two, passed from this to a higher and better life, having attained a fulness and ripeness of age beyond that of the common lot of men.

Dr. Allen stood as a representative man in the profession of his choice.

In the line to which he gave special attention he was the chief, and was so recognized not only in this but in the countries of the world wherever prosthetic dentistry is known and practised. He it was who brought to its present high state of perfection that variety of substitutes known as continuous gum dentures.

Though his chief attention and labor were devoted to this special work, he was interested and took part in the various lines of thought and effort that were employed for the development, growth, and establishment of dental science and art. He was ever ready to defend, and sought to elevate the profession to a higher plane of usefulness.

Dr. Allen was one of the organizers of the Ohio College of Dental Surgery, a professor and an efficient teacher in that institution.

In the subject of dental education he always manifested a warm interest. A writer of more than ordinary ability, he has added many valuable contributions to the literature of the profession.

He was an active member of this Association from almost the time of its organization, and did much to promote its welfare. He was also a member of, and an active worker in, a number of other dental societies.

Dr. Allen was a man of purest character and highest integ-

rity; one not only respected but loved by all who knew him; in manner most affable; in bearing dignified; in spirit gentle and sympathetic.

The loss of such a one is always an occasion of sadness and sorrow, but we have the consolation of the knowledge that his career was rounded, full and complete, and his death closed a life filled with good works for his fellow-men.

In view of the above,

Resolved, That we will ever cherish the memory of our departed brother, and seek to establish and perpetuate the high principles that were so fully illustrated in his noble life.

Resolved, That the traits so pre-eminently characterizing the life of him we now commemorate are worthy not only of our high regard, but most earnest emulation.

Resolved, That this testimonial be placed on a memorial page of the transactions of this body, and a copy, properly engrossed, be sent to the family of the deceased; also that a copy be sent to the dental journals of this and other countries for publication.

IN MEMORY OF C. A. KINGSBURY, M.D., D.D.S.

Within the last year Dr. Chas. A. Kingsbury was called from this to a higher life, in the seventy-second year of his age.

Dr. Kingsbury many years ago became identified with this Association, and retained his membership to the time of his death, and though he was not always present at its meetings, so highly was he esteemed by the membership of the body that it was a pleasure to all to have his name upon the roll of members.

Dr. Kingsbury entered the practice of the profession in 1839, in Philadelphia, and continued actively engaged in its pursuit during his life. He studied dentistry in Trenton, N. J. He was intimately acquainted with the leading men of the profession almost the whole of his professional career, and imbibed in a large measure the interest and enthusiasm of those men for dental science and art; indeed, that association in a degree shaped his professional life. He was familiar with all things that entered into the development and progress of dentistry for about fifty years. He was a man of liberal learning and broad culture; one whose sociability was a predominant characteristic. In his early life he was a teacher, and, after many years' practice of his profession, he was for a time a successful teacher in one of the dental colleges in the city of his home. He was highly esteemed by all who knew him; he was a man of sterling characteristics, genial, kind, and sympathetic in his asso-

ciation with his fellows. In his death, not only this Association but the entire profession loses another of the pioneers who was ever devoted to its interests, ever contributing of his resources to its upbuilding.

Resolved, That we will ever cherish the memory of our departed brother as one whom we delight to honor and to emulate in his leading characteristics.

Resolved, That this statement and resolution be placed upon the memorial page of the proceedings of this body, that a copy, in proper form, be transmitted by the secretary to the family of the deceased, and that it be sent to the journals for publication.

Current News.

COMMITTEE ON ESSAYS (No. 17) OF THE WORLD'S COLUMBIAN DENTAL CONGRESS.

PRELIMINARY NOTICE.

It is the aim of the World's Columbian Exposition "to gather together evidences of the material progress, achievement, and civilization of the world, and so arrange them that every department of human endeavor may be studied and examined through all its various grades of development." In recognition of the important part which the growth and professional development of dental science and art have contributed to the world's progress, the holding of a "World's Columbian Dental Congress" under the auspices of the World's Congress Auxiliary has been provided for by a duly authorized general executive committee, appointed by the dental profession of America through its two governing dental organizations. The undersigned committee, being intrusted through authority of the general executive committee with the duty of soliciting essays appropriate to the "Division of Dental and Oral Surgery," and realizing the necessity and great importance of a proper presentment of the literary and scientific phases of our profession through the contributions of its representative men, respectfully invite the preparation of papers directly or collaterally connected with the above-named department, to be submitted to this committee at least three months previous to the convening of the congress, the date

of which will be August 17, 1893. All essays must be in the hands of the committee at the time requested, in order that opportunity shall be afforded for their arrangement and assignment to appropriate sections. Those contributions earliest received will, of course, take precedence. The committee especially desires that answers to this request, including the titles of papers, shall be forwarded to the chairman at as early a date as possible. The authors of those papers which are accepted by the committee for a place upon the programme will be notified of the fact as promptly as possible. Information respecting the special prize essay on oral hygiene may be obtained from the chairman of the Committee on Prize Essay (No. 23), Dr. Theodore Stanley, Kansas City, Mo.; information respecting essays in general, from the chairman of the Committee on Essays (No. 17). Forward all communications to the chairman of the Committee on Essays, Lock Box 1615, Philadelphia, Pa.

Dr. Edward C. Kirk, *Chairman*, Philadelphia, Pa.
Dr. J. W. Wassall, Chicago, Ill.
Dr. A. H. Thompson, Topeka, Kan.
Dr. H. H. Johnson, Atlanta, Ga.
Dr. L. G. Noel, Nashville, Tenn.
Dr. C. Newlin Pierce, Philadelphia, Pa.

RECENT PATENTS.

A list of recent patents, reported specially for the International Dental Journal.

477,791.—Dental Reflector and Tongue-Guard. Walter E. Andrews, New York, N. Y. Filed February 25, 1892.

478,217.—Dental Forceps. Charles E. Blake, Sr., San Francisco, Cal. Filed October 22, 1891.

478,312.—Clamp for Dental Flasks. Morgan R. B. Creery, Ebensburg, Pa. Filed December 5, 1891.

478,343.—Dental Tool. Charles P. Lennox, Toronto, Canada. Filed December 11, 1891.

478,589.—Dental Chair. William H. Gilbert, Philadelphia, Pa., assignor to the S. S. White Dental Manufacturing Company, same place. Filed March 24, 1890.

478,590.—Dental Chair. Aaron P. Gould, Canton, Ohio. Filed June 5, 1890.

478,672.—Dental Chair. Basil M. Wilkerson, Baltimore, Md.,

assignor, by mesne assignments, to the S. S. White Dental Manufacturing Company, Philadelphia, Pa. Filed December 21, 1877.

478,881.—Dental Tool. Edward C. Moore, Detroit, Mich. Filed January 29, 1892.

Designs.—21,666.—Dental Cabinet. Josiah O. Keller, Fort Wayne, Ind. Filed May 14, 1892. Term of patent, fourteen years.

478,992.—Dental Engine. Frank A. Damond, Fitchburg, Mass. Filed April 6, 1892.

481,164.—Dental Engine. F. A. Damond, Fitchburg, Mass. Filed July 16, 1891.

481,479.—Dental Clamp. J. S. Deardorff, Canal Dover, Ohio. Filed March 28, 1892.

Trade-Mark. 21,733. Dentifrice. Florence Manufacturing Company, Northampton, Mass., New York, N. Y., and Chicago, Ill. Filed June 20, 1892. Essential feature, the words "Twin Luxuries."

BOARD OF EXAMINERS OF DISTRICT OF COLUMBIA.

Appointments made by the Commissioner of the District of Columbia to the first "Board of Dental Examiners:"

William Donnally, D.D.S., for five years; H. M. Schooley, D.D.S., for four years; J. Roland Walton, D.D.S., for three years; H. B. Noble, D.D.S., for two years; John B. Rich, D.D.S., for one year.

The board organized by electing J. Roland Walton, President; William Donnally, Secretary.

WORLD'S COLUMBIAN DENTAL CONGRESS OFFICERS ELECTED AT CHICAGO.

President, L. D. Shepard, Boston, Mass. *Vice-Presidents*, W. W. H. Thackston, Farmville, Va.; A. L. Northrop, New York, N. Y.; W. H. Morgan, Nashville, Tenn.; W. W. Allport, Chicago, Ill.; W. O. Kulp, Davenport, Iowa; C. S. Stockton, Newark, N. J.; Edwin T. Darby, Philadelphia, Pa.; H. J. McKellops, St. Louis, Mo.; J. Taft, Cincinnati, Ohio; J. H. Hatch, San Francisco, Cal.; J. B. Patrick, Charleston, S. C.; J. C. Storey, Dallas, Texas. *Secretary-General*, A. W. Harlan, Chicago, Ill. *Assistant Secretaries*, Geo. J. Friedrichs, New Orleans, La.; Louis Ottofy, Chicago, Ill. *Treasurer*, J. S. Marshall, Chicago, Ill.

THE

International Dental Journal.

VOL. XIII. DECEMBER, 1892. No. 12.

Original Communications.[1]

TREATMENT OF FRACTURE OF THE MAXILLÆ.[2]

BY DR. WILLIAM CARR, NEW YORK.

NUMEROUS methods and appliances have been devised for treating fractures of the maxillæ, some of which have fallen into disuse, while others are yet employed with varied degrees of success. Among these are bandages, wiring, clamps, and splints,—the latter, in some form, being generally adopted as the most practical.

An article entitled "A New Method for the Treatment of Fracture of the Maxillæ," by Dr. Edward H. Angle, of Minneapolis, was published in the INTERNATIONAL DENTAL JOURNAL for June, 1890, in which fractures of the maxillæ were divided into three classes, and for the third class—fractures of edentulous jaws—the following treatment was proposed: "In place of the teeth, small bone-hooks are used, drilling for their reception a suitable cavity on each side of the fracture, comparing in position to the original sockets of the teeth, the same as if the operation of implanting teeth was intended; the cavities thus made need not be so large or deep. They should also be drilled obliquely to correspond to the course taken by the hooks."

[1] The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

[2] Read before the New York Odontological Society, Tuesday evening, October 18, 1892.

This proposed treatment is nearly identical with that mentioned in 1867, by Wheelhouse, of Leeds, England, in case of triple fracture,—jaws not edentulous,—in which he used silver pins instead of bone-hooks suggested by Dr. Angle. Humanity protests against such cruel operations when the interdental or intermaxillary splint affords such rational treatment for these fractures. At the present time, persons with edentulous jaws, even though poor, are rarely without artificial dentures, which may readily be converted into a splint by removing the incisors and canines from the upper denture to afford sufficient space for receiving nourishment; then articulating the upper and lower dentures and firmly uniting them. Such a splint will meet all the requirements of fractures of edentulous jaws, and it may properly be termed an intermaxillary splint. In 1848, Hullihen invented the intermaxillary splint, which was the outgrowth of the interdental splint invented by Desirabode in 1823. The following distinction between the splints is made by Dr. Farrar in the work on "Correction of Irregularities of the Teeth:"

The *interdental* is used to retain the teeth in position after correcting irregularities, and also to retain teeth in original position which, having been knocked out, accidentally or otherwise, have been replaced in their sockets, while the *intermaxillary* is adapted to treatment of fractures of the maxillæ.

Within a few years great improvements have been made in interdental and intermaxillary splints, notably in those made by Dr. Kasson C. Gibson, of New York, who has had an extensive experience in the treatment of fractured maxillæ. He first devised the saw-frame splint, which is a saw-frame similar to those used in dental laboratories and by jewellers: the handle being removed, in its place is screwed a piece of brass or German silver for a chin-piece; the upper portion of the frame is split to within a few lines of the perpendicular portion, to correspond with the jaw and teeth, and to this is attached a vulcanite splint. After successfully using this splint for some time, Dr. Gibson devised another appliance, which he has adopted as fully meeting the requirements of cases which need a metal compress. The following is its description, as given in the *Dental Cosmos* of August, 1890:

"*First.* The compressor (used without alteration for all cases), consisting of a horizontal rod (A) and a vertical rod (B), each about two inches in length, meeting at right angles. Rod B is hollow, and at its upper end is fitted a thumb-screw so adjusted as to hold at any point in it a movable rod (C), thus regulating pressure. Passing horizontally through a bulb at top of rod C is a rod (D)

three inches in length, bent downward at right angles for about an inch. One-half of this lower end is smaller in diameter than the other half, leaving a shoulder. A thumb-screw in the bulb admits of the adjustment of rod D at any angle.

"*Second.* The chin-piece is attached to the compressor by a thumb-screw, so adjusted that it may be pushed backward and forward on the rod A, and at the same time affording a double rotary movement. The chin-piece is made in different forms, each peculiarly adapted to the location of fractures. If fracture is at or near the symphysis, the chin-piece consists simply of a flat piece of brass placed directly under the chin; if back of the cuspid teeth, involving the molars, it should fit the chin, extending back to the angle of the jaw; if involving both the angle and the condyle, it must include the entire lower jaw, and extend to the line of the ear. A metal button (E) should be attached on each side of the chin-piece for use in attaching any necessary support. For support nothing surpasses a skull-cap, to each side of which can be attached a piece of elastic reaching to the chin-piece; this in turn can be fastened to the metal button by a ring sewed in the end of the elastic.

"*Third.* The inner steel bands are made of various sizes and shapes to conform, as nearly as possible, to the contour of the jaw, and to the teeth, and are vulcanized in the splint."

This splint enables the patient to masticate freely, and it is efficient, whether the fracture is simple, compound, or complicated. Its use is especially indicated where complication—as necrosis or abscess—is liable to occur. But in cases where the displacement is inward and outward, the wire splint devised in 1876 by Dr. Gunnel E. Hammond, of Paris, and modified by Dr. Gibson, is preferable. The objection to this splint as originally devised was, that in masticating, the ligature securing the splint to the teeth worked below the free margin of the gums, greatly irritating them, and also causing elongation of the teeth. In the modification this objection was overcome by soldering pieces of wire from the buccal to the lingual surface of the splint between the molars and bicuspids, which effectually prevents the splint from settling or irritating the gums. Should the wires between the teeth interfere with proper mastication, this difficulty may be obviated by covering the entire surface with gutta-percha.

In my own practice I have used the appliance known as Williams's Modified Interdental Splint, which is an improvement of the Gunning splint. The principal advantage of using this lies in the fact that the patient is enabled to continue his usual occupation

without attracting special attention to his condition, as there are no external appliances connected with it. He cannot masticate, but receives nourishment in a liquid or semi-liquid form.

There is but little difficulty in establishing the correct diagnosis of fracture of the maxillæ, as the following symptoms are usually present: Severe pains in the effort to open or close the mouth, swelling, crepitus, inflammation, inability to masticate, and marked irregularity of the teeth, with more or less displacement.

Fractures of the maxillæ are caused either by accident or by direct violence; usually by accident when the superior, or both superior and inferior are involved, and by violence when the inferior only is fractured. A noticeable circumstance in connection with these fractures is that the patient rarely applies for treatment for several days succeeding the injury, which, if resulting from violence, is usually inflicted while fighting, when from intoxication or other causes he is not cognizant of the nature of his injuries. He is aware that some of his teeth are loosened, as also that his face and mouth are badly bruised and correspondingly painful, but he does not apply for surgical aid until alarmed by the increased inflammatory condition of the parts.

Fractures of the inferior maxilla may occur at any part of the bone; they are rarely found at the symphysis menti or at the coronoid process. Occasionally the ramus and angle are fractured. Should the condyle be fractured it will usually take place at its neck, resulting from a fall upon the chin or from a blow received at or near the angle. Most frequently fractures occur in the body of the bone in the region of the mental foramen.

Although there may be considerable displacement in fractures of the superior maxilla, yet, if properly treated, serious complications seldom arise, owing to the great vascularity of the parts.

The treatment is identical with that for other fractures,—namely, to bring the parts into apposition and retain them firmly until ossification is complete. When the splint is properly adjusted, speedy union may be secured without deformity of the jaw or irregularity of the teeth. Before taking an impression a careful examination of the parts should be made by passing the finger along the margin of the jaw, to ascertain whether any foreign substance or loose pieces of bone are present. No effort should be made to reduce the fracture before taking an impression, as this is practically useless and inflicts unnecessary pain. Should there be loose or fractured teeth or diseased roots, they should be removed immediately, as their retention might possibly interfere with union.

Also, all exposed pulps should be devitalized, as they might cause considerable suffering during treatment.

When the inferior maxilla only is fractured, an impression of the upper jaw should first be taken in order to secure the confidence of the patient; then take an impression of the lower jaw, using an ordinary lower impression-cup, avoiding the use of too much compound, as only an impression of the teeth is required. For this purpose use S. S. White's or Hood and Reynold's No. 2 Impression Compound as warm as the patient can bear it, in order to prevent unnecessary pain; also, to prevent further displacement of the parts, allow the compound to remain until hard; this will insure a sharp impression.

In making models, mix sulphate of soda or salt with the plaster to give solidity, saw the cast at the point of fracture, and articulate with the cast of the upper jaw; unite them with a few drops of melted wax and immerse the cast of the lower jaw in water, keeping it immersed until thoroughly saturated; then reunite the two parts previously sawed by filling the space with thin plaster. When this has hardened, secure both casts in an articulator. Before waxing, trim the necks of the molars and bicuspids of both casts. This trimming is necessary to secure a tightly-fitting splint, as an impression rarely takes the undercuts of the teeth. Separate the casts by means of the screw at the back of the articulator, leaving a space of about four lines between the incisors. This will leave sufficient room for the patient to receive nourishment. Place a strip of ordinary sheet-wax over the teeth of the lower cast, extending it to the free margin of the gum. Also wax in the same manner the teeth of the upper cast as far forward as the *canines;* next place a roll of soft wax on the grinding surface of the molars and bicuspids, and bring the articulator firmly together; remove the excess of wax, and smooth; then remove the articulator and proceed to invest as far as in an ordinary vulcanite case, taking extra precaution to thoroughly saturate the casts with water, to prevent the formation of bubbles while flasking. After removing the wax, paint the teeth with collodion or liquid silex and cover with tin foil; then pack, having the rubber as soft as possible. Vulcanize for two hours at a temperature ranging from 280° to 300°, in order to secure an elastic splint. Before adjustment, deepen the depression for the molars about one line; drill a small hole on the buccal surface of the splint over the grinding surface of each molar, for the purpose of ascertaining whether, after adjustment, the teeth are in proper position; adjust the splint to the upper jaw, and gently

bring the lower jaw with the fractured portion or portions into position until it has passed about two-thirds the length of the teeth. Then with a quick, firm movement bring the parts into place; this movement will, necessarily, be very painful for the patient. After adjustment, pass the finger along the body of the lower jaw, to ascertain whether reduction is complete. Next apply the four-tailed or the straight bandage, which should be retained from three to five days, after which, in most cases, it may with safety be removed during the day, but it should be replaced at night until the splint is removed.

The patient should be instructed to keep the mouth thoroughly cleansed, rinsing it morning and evening, first with tepid water, afterwards with equal parts of tepid water and peroxide of hydrogen; at intervals during the day listerine mixed with tepid water, in the proportion of one to three, should be used for the same purpose.

In ordinary cases the splint should be retained three or four weeks, according to the age and physical condition of the patient.

Unless unforseen complications should arise, the application of the splint, combined with thorough cleanliness, will usually be all the treatment required.

The following are a few of the cases treated by this method:

Case I.—Mrs. D., aged twenty-eight, during an altercation with her husband, received a violent blow upon the face, which caused a double fracture at the angle of the jaw. Being poor, she applied to a dispensary for treatment. An effort was made to wire the parts, which was unsuccessful, owing to their bruised, swollen, and inflamed condition. The splint was adjusted ten days afterwards and remained for twenty-one days, when the teeth had occluded perfectly without any deformity of the jaw.

Case II.—A plumber, aged forty. During a strike he did not go out with the Union, and was assaulted while returning from work at night, being struck with what he supposed to be a sand-bag, at the lower portion of the body of the jaw. The next day, upon examination, an oblique fracture was found on the right side between the canine and the first bicuspid. The splint was adjusted, and occlusion was perfect in twenty-three days.

Case III.—John B., a clerk, aged thirty-three, while attempting to spring upon a rapidly-moving street-car, fell and fractured both sides of the inferior maxilla between the lateral incisor and canine on the left, and between the bicuspid and canine on the right. A few hours afterwards the splint was applied and retained for twenty-one days. Perfect occlusion.

Case IV.—S. B., a student, aged nineteen, while playing foot-ball and running, with mouth open, struck the teeth of the superior maxilla against the shoulder of a fellow-student with such force that the superior maxilla and alveolus were fractured. The line of fracture was well defined, on the right side between the canine and bicuspid, and extending on the left between the canine and lateral incisor, the teeth within this line being forced inward, so that the labial surface of the teeth of the superior touched the lingual surface of the teeth of the inferior when the maxillæ were brought together. The upper lip was greatly swollen and bruised. When the teeth had been forced into proper position, the line of fracture could not be felt while passing the finger over it. An impression was taken of the entire upper maxilla, and a vulcanite plate constructed similar to those used for the regulation of the teeth. This was adjusted and retained for twenty-one days, when complete union had taken place.

I have examined the teeth of this patient at intervals during the past six years, and find that none of the pulps of the teeth involved in the fracture are devitalized.

Case V.—Michael M., a bar-tender, aged forty-six. The inferior maxilla was fractured on both sides during a bar-room fight. The fracture occurred on each side at the point where the second molar had previously been extracted. The splint was adjusted and retained for twenty-one days. Result perfectly satisfactory.

Case VI.—George A., salesman, aged thirty-three. This fracture was due to a discussion of the "McKinley Bill," a violent blow upon the jaw being the final argument. Upon recovering from the shock, the patient returned home and sent for his family physician, who made an examination and decided that although his face was greatly bruised, he was otherwise uninjured, and directed that an infusion of chamomile leaves be applied. As the patient could masticate only with great difficulty, he consulted his dentist, who sent him to me for treatment five days after the occurrence. Upon examination a fracture was found in the right side of the inferior maxilla, between the lateral incisor and the canine. The splint was adjusted on the sixth day and removed on the twenty-first. Occlusion of the teeth perfect.

Case VII.—Patrick S., a laborer, aged sixty-five, was injured by a pile of bricks falling upon him. His entire body was greatly bruised. The lower maxilla was fractured on the left side between the first and second molars, and on the right side between the canine and bicuspid; the upper maxilla being fractured between the

second and third molars, extending forward between the canine and lateral incisor, and involving the palatine bone. An opening had also been made into the antrum. Saw patient six days after the accident, and found that no effort had been made to reduce the fracture. When the mouth was opened the fractured portion of the upper maxilla rested upon the tongue and the teeth of the lower maxilla, being held only by the mucous membrane of the palatine surface. It was deemed advisable to exsect the displaced portion, which was done, and the mucous membrane carried over the exposed antrum and held firmly by compress. The following day the splint was adjusted. When it was removed, in thirty-five days, there was no displacement nor further trouble with the antrum.

Through the courtesy of W. C. Barrett, M.D., of Buffalo, I am enabled to embody in this paper the following report of a remarkable case of green-stick fracture treated by him:

"I was called upon one afternoon by a prominent and skilful surgeon of my city, who was very earnest in his request that I should at once go to his office. On asking him what was the matter, he informed me that I would find out when I got there. I found four physicians, besides the surgeon, and a boy of about twelve years of age lying under the influence of an anæsthetic, whose head had been run over by a tender of a steam threshing-machine. The physicians and surgeon had been at work over him for nearly four hours, and had not succeeded in getting matters in a satisfactory state. The lower jaw had been fractured in two or three places upon the left side, and the parts had been nicely wired into position. The jaw was under muscular control, but upon an attempt to close it, the whole was deflected considerably to one side, and all efforts to remedy this state of affairs had failed. The surgeon said that he, as well as the physicians, were not ashamed to say that they were at their wits' end, and could not account for the condition. He had proposed calling me in as a specialist, and all had concurred. They therefore wished to put the case in my hands for a diagnosis.

"Upon examination, I found that the fractures upon the left side were well reduced, and held by the wires about the teeth. There was no crepitation upon the right side, nor was there any evidence of luxation. When the jaw dropped to its fullest extent and the muscles thereby relaxed, there was no apparent deflection, but upon closure it was carried to the left.

"It was apparent that a diagnosis could only be arrived at by exclusion. The fact that the jaw was under muscular control showed that there was no dislocation. As there was no crepi-

tation and no digital signs of displacement, there could be no complete fracture. But a more careful examination showed that while the wiring held the parts well together and reduced the fracture, it did not entirely prevent a lateral deflection. This, under the circumstances of the case, could not exist without a corresponding divergence upon the other side. There must, therefore, be an incomplete fracture of the right half of the maxilla. This must be across the body of the bone, anterior to or near the insertion of the internal pterygoid and the masseter muscles of that side. The corresponding muscles of the opposite side, under the undue irritation of the fractured parts, contracted violently, and having no opponents to counteract them, the anterior part of the jaw was, at each such contraction, drawn out of its true plane.

"I accordingly announced my opinion that there was a 'green-stick fracture' of the right half of the inferior maxillary bone. 'What,' said the surgeon, 'a green-stick fracture of a short bone?' 'Why should a green-stick fracture of a short bone in a boy of twelve or fourteen be any more strange than the same condition in the long bone of an old man? And yet we know that is sometimes the case,' was my answer.

"After further examination my diagnosis was accepted, and the patient, at the request of the physicians and surgeon, put in my hands for treatment. He was carried to my office and again anæsthetized. Some common gutta-percha was softened by heat and an impression taken of each jaw, the lower one, of course, with the muscles relaxed. These impressions were trimmed to the proper shape for splints, a hole being made at the symphysis, half of it in each one, through which the boy could be fed. The surface of the gutta-percha splints were then softened by heat and put in place. Then, standing directly at the head of the patient, I grasped the left lower jaw firmly with my left hand, the right being placed against the opposite ramus, and by steady and forcible pressure I closed the jaw, at the same time resisting the tendency to deflection, and thus secured a proper occlusion of the two halves of the gutta-percha splint. The softened surfaces, upon coming in contact, cohered at once, and they were held thus until by a spray of cold water they were hardened. Still holding the whole firmly, the surgeon applied a two-tailed bandage and everything was made secure.

"The next day the inflammation had somewhat subsided, the bandages were tightened, the case dismissed to the care of the regular physician who had accompanied him to the city, and the boy was taken home, some fifty or sixty miles away.

"The bandages were removed in due time, and the physician wrote me that the result was all that could be hoped for, the slight inequality in occlusion of the teeth soon regulating itself, while there were no external marks of the injury whatever that were visible."

CROWN- AND BRIDGE-WORK.[1]

BY DR. C. M. RICHMOND, NEW YORK.

(Continued from page 792.)

In the present article I have illustrated a novel operation. The four incisors are worn down very near to the gum-line, and all have the pulps alive. The surfaces were cut and smoothed as much as the patient would endure, as they were extremely sensitive, being of a peculiar temperament that could not tolerate a root with the pulp out. It was decided to restore the case with a movable bridge.

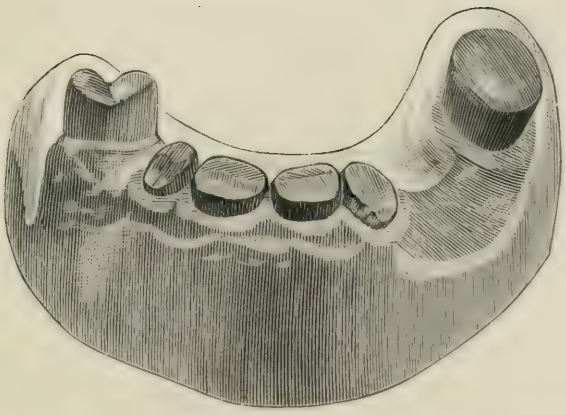
The molar and bicuspid were first crowned with gold or fitted with gold crowns, leaving them uncemented until the case was finished; then they were placed into position in the bridge, and were cemented on as if it were to be a fixed piece, the reason being that from the irregular position of the two teeth in relation to one another and to the bands, it would be impossible to secure the bearings right in any other way. The case then could be removed without trouble.

After the crowns were finished they were placed, cutting end down, into plaster, and after becoming sufficiently hard the sides were cut away, leaving a small, square block of plaster with the gold crowns embedded in it. The plaster was then cut slightly on each side and on the end, and then the block was broken apart and the crowns removed. The two broken pieces were tied together with silk and a perfect model of each cast with fusible metal. (When I refer to fusible metal, I mean that made by R. S. Williams from the formula I gave him, also published in one of my articles, as it is the only metal I know of that is hard enough to endure the work required, it being as hard as zinc.) The bands were now made on these dies in the way described for constructing the double band, and fitted perfectly, remaining closed and slipping on and off quite hard. An impression was taken of the incisor roots, and a die

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[1] Copyrighted, 1892, by Dr. C. M. Richmond.





made in the same way as the others, all in one model, however. A cap of pure gold is burnished on to this to the gum-line on the palatine and to the front edge of the facial surfaces. As the teeth were to be fitted to the roots, and the roots to make one-quarter of the exposed surfaces, very irregular curved teeth were resorted to, in order to secure the shades and shapes to suit the case. After six or seven trials a most perfect match and fit were obtained. The teeth to fill in the space posterior to the bicuspid and anterior to the molar were also carved in blocks, with the gum baked on to make the finishing surfaces perfect. The five front teeth were fitted and soldered to the gold cover made for the front teeth; the curved blocks were fitted and soldered to gold plates made to fit the gum surfaces where the spaces were to be filled, in the way described, by pure gold being burnished on to dies.

The case was now put into the mouth in sections, the molar block waxed to the bicuspid band, the crown placed on in its proper position, and the part then tried on. The teeth were closed and the block arranged in its proper place. It was then carefully removed and invested, and the block soldered to the band. The block anterior to the molar was tried in the same way, and when in its proper position was also carefully removed, invested, and this block soldered to the molar band. Each block was so arranged that we could wax the whole case together and try in one piece. In doing this the front piece was waxed to one side first, and inserted to have it properly adjusted. Then, after removing, a piece of wire was heated and dropped into the wax, melting its way into it, and in this way the case was held together strong enough to try on and adjust, without its breaking apart at the joint where it was to be soldered. This was placed into an investment and soldered, and the last trial was made of the pieces in the mouth. The pieces were waxed together; the two gold crowns were placed into position in the work and tried in the mouth. This brought the teeth into position, and the whole case was in readiness for the last impression, which was taken as a matrix guide, to be used after it was ready for the last investment. After taking the case off, it was placed in the investment and soldered for the last time.

It will be seen, in referring to the plaster model, that the case looks impossible from the situation of the teeth, the molar standing out of the arch, and also having a forward pitch. The bicuspid is almost in its natural position, yet the case would go on and off by starting the molar-band first, and when in position was held absolutely firm.

The patient visited my office three times and saw the methods employed in constructing such cases, and, being a dentist, returned to his office, and by the aid of an assistant constructed the entire case himself. The only part I did was to finish the operation by cementing the gold crowns, as before described.

Dr. C. P. Wilson, 85 Newberry Street, Boston, is the dentist referred to, and any one who wishes to see one of the finest pieces of dental work ever constructed should visit him and request him to exhibit it. The front teeth are so well fitted that no one can detect where the joint is without a close examination.

I have had some new spatulas made for mixing cement. I found that the acid would at once attack steel, and as soon as the nickel was worn off a chemical action would at once take place. I now use copper or nickel for spatulas for all cements. I also use a cube of glass instead of a slab. A three-inch cube can be placed in hot water a moment, and sufficient heat will be absorbed, so that all trouble from thermal changes is at once avoided.

(To be continued.)

MECHANICS IN DENTISTRY.—IS DENTISTRY A SCIENCE OR A PROFESSION?[1]

BY W. G. A. BONWILL, D.D.S., PHILADELPHIA.

A VERY unpalatable subject is this I have chosen,—"Mechanics in Dentistry." There is no other word in dental language that is held, to-day, in such disrepute. Every year there is fresh venom hurled against it, or any reference thereto, and it would seem to have fallen from the high eminence which it had in the early days. The good old name has a very strange synonyme,—prosthesis,—which might be well if it were confined to the supply alone of artificial dentures. A moment's reflection, however, will show that when we attempt to divide dentistry into operative and prosthetic or mechanical, we do injustice to our profession, and we assume a false position for our great art, which is founded almost exclusively in our ability as mechanicians, and without which, to a great degree, we would be helpless.

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[1] Read before the Odontological Society of Pennsylvania, Saturday, October 8, 1892.

It has become such a disgrace to be known as a mechanic that it is amusing to see, not only dentists, but nearly every man upon the street, or wherever you may go, taking to the English mode of carrying the arms bent at a decided angle at the elbows, and the thumb projecting from the wide-open hand at as great a tangent as possible. You may be curious to know what this means. Well, I am responsible for the version and why originated.

The very act of using the hands to grasp the handle of a hammer, or lift a weight, necessitates the closing of all the fingers and the thumb over them, while the arm is usually, when lifting, nearly in a straight line. These finally give to the individual, when walking, arms that assume a line parallel and vertical with their body, with the hands mostly closed. See the application. A gentleman found with his arms bent at the elbows and thrown as far as possible—gracefully—from contact with the body, his hands with all fingers outstretched and thumb at a right angle with the index finger, will be known as one who never grasped an instrument or extended his arms straight to lift any object. The poor mechanic will be found invariably to take on exactly the opposite. He has never heard of "Hogarth's line of beauty." You may smile at this, but there is too much truth in it. I do not object to graceful positions, but teach the mechanic what it means and let him be an artist.

Students generally feel this tendency of our profession, and it is almost impossible to get them to prosecute this branch of dentistry. Unless they are compelled to learn laboratory work first and thoroughly, they never become efficient in the mechanical department. Once permit them to go to a dental college, where they are allowed the first session to handle delicate instruments over the operating-chair instead of rough tools, the hammer and the "anvil chorus" is no longer heard.

Before we touch upon science, let us ask whether we are a profession? What is its meaning?

The three learned callings are theology, law, and medicine.

The occupation, if not mechanical or agricultural, is placed as a profession. If you can make this of dentistry I am unable to interpret the meaning of our lexicons. The teaching of mathematics does not make it a profession any more than teaching mechanics. We cannot, then, arbitrarily place ourselves before the world as a profession, as now understood; but we are artists, artisans; or we can, more properly, be called scientific artisans.

What is science?

Science is a systematic and orderly arrangement of knowledge.

Facts and truths are the ultimate principles.

Pure science is a knowledge of forms, causes, or laws.

"While both science and art are synonymous, as they investigate truth, science is restricted to the inquiry for knowledge and art for the sake of production."

"The most perfect state of science will be the high and accurate inquiry, and the perfection of art the most apt and efficient system of rules,—art always throwing itself into the form of rules."

What are the sciences which have been so long recognized as seven in number?

Grammar, logic, rhetoric, arithmetic, geometry, astronomy, and music.

You perceive that medicine, law, and theology are not mentioned. They are professions.

You do not find mechanics among the seven. Yet mechanics is made up of geometry and arithmetic, placed together and made efficient and demonstrable by that higher power—God-like in itself—that conceives, designs, and creates, and which is of more importance than any and all of the others.

Boyle says that mechanics, in a larger sense, is for those disciplines that consist of the application of the pure mathematics to produce or modify motion in inferior bodies.

Huxley says, in the *Nineteenth Century*, "Newton defined the laws, rules, or observed order of the phenomena of motion which come under our daily observation with greater precision than had been before attained, and by following out with marvellous power and subtlety the mathematical consequences of these rules he almost created the modern science of pure mechanics."

Newton, in the preface to his "Principia," says, "The ancients made great account of the science of mechanics in the investigation of natural things, and considered mechanics in a twofold respect,—as rational, which proceeds accurately by demonstration, and practical.

"To practical mechanics all the manual arts belong, from which it took its name.

"To describe right lines and circles are problems, but not geometrical ones. The solution of these problems is required of mechanics, and by geometry the use of them, when solved, is shown. Therefore geometry is founded on mechanical practice, and is nothing but that part of universal mechanics which accurately proposes and demonstrates the art of measuring. Rational mechanics will be the science of motions."

He finally says, "I wish we could derive the rest of the phenomena of nature by the same kind of reasoning from mechanical principles."

Thus you see this great master's high estimation of mechanics, and he clearly shows that geometry and mathematics are the two simples that, when combined, give a result that has builded worlds, and without which Newton could not have discovered gravitation, nor could Kepler have formulated his "three laws of motion" which regulate the universe of suns and stars.

Tyndall said of Goethe, in scientific pursuits, that he was so devoid of mechanical principles and the minute details of the powers of construction that he was an ignis-fatuus, and unworthy to be followed.

What gave to the Egyptians the glory that to this day crowns their everlasting works in architecture and their tombs? Mechanics. Their monuments have never been excelled in perfect symmetry and beauty, and their pyramids show no lack of comparison in their calculations in the distance of the sun from the earth with the astronomers of to-day.

Where would they have been in history but for their mechanical productions, that promise to continue for thousands of years? What does the history of all nations have to show of greater interest and more lasting in its results than the mechanism displayed by its peoples? What could Napoleon have said when in Egpyt with his army at the foot of the great pyramids that would have created more enthusiasm than when he most poetically exclaimed, 'Forty centuries look down upon you!" What if he had said the work of one hundred thousand poor mechanics, hod-carriers, stonemasons, carpenters, blacksmiths, and artists look down upon you? Go ask the architects of all those wonderful temples on the Nile how they moved those immense granite blocks from the quarry, and how raise them until pile on pile had massed a structure, the mode of doing which the wise mechanics of to-day cannot explain?

Ask the Roman Cæsar what gave him his power in battle? How could those magnificent pieces of masonry have been accomplished but for the skilled mechanics? Coming down to our own times, where is Watt? He lies entombed in Westminster Abbey, by the side of all that is honored in literature, art, science, and war. He was a mechanic!

Sir Christopher Wren. Is his name not upon every lip? What could he have done as a great architect without his inspired mechanical ability?

What has the printing-press done for mankind? It required a mechanic not only to make the type but the press. Is there any monument to the maker of these? Yes. Where is the monument to the dentist?

Morse needs no monument to tell those who may come four thousand years hence of the apparatus invented by him.

Ask Franklin, that universal genius, whether he would wish us to call him a mechanician?

We can ask the *Freemason.* His craft has come down to us through the course of time. No record shows its beginning. We see it to-day in man's memory only as it was in the inception. No tablet has written upon it a word to show its secrets, and yet they are emblazond on everything from the bottom to the highest pinnacle of the Mason's work. "Geometry is Masonry upon a general scale." Who does not consider it a high honor—the highest—to be admitted into its hallowed courts? Who of you that have officiated in its halls and chambers but is impressed at every "step" and every "halt" of the sacredness and importance of the science taught? Labor is engraven upon every panel of the doors that stand guard at "Who comes here?"

Ah, my fellow-members of the dental craft, how much longer will you persist in your ignorance and stupidity? I cannot lose sight of the days in my youth when I once made the jack-plane curl up the shavings to my delight, and how I turned these hands to account in the carpenter-shop, or the cabinet-makers' department, and when I could help to build a house, make a cradle or a coffin, chisel out a gun-stock, or make a blacksmith's or a church-organ bellows; or when there was nothing of this for me to do, I could go into a country store and measure the molasses or the calico. I am glad now of that varied experience.

I am very proud of mechanics when I look around and see men in dentistry who were once poor carpenters, and others engaged in other forms of mechanical trades, attempting to relegate mechanical dentistry to the shades. I feel sure that they never became masters of the art.

For all that is "true" in mechanical dentistry, what, on the other side, is false? We hear of little else at the present time but "science." They attempt to put down every man who has anything to say upon any other subject, and remind him that "if we would elevate our profession" we must take up the subjects of Remedies and Bacteriology. We must no longer fill teeth and resort to the mechanical manipulators.

Professor Miller, of Berlin, in an article read before the Southern Dental Association in 1890, or 1891, spoke of Arthur and Bonwill, who were the advocates of mechanical skill in dentistry, and asserted that it was not scientific to do as they were doing; that the mechanic had no place with the scientific men.

A better example cannot be given than the action of the four honorary American presidents of the International Medical Congress in Berlin, in 1890, Dental Section. The Committee on Essays invited me to read a paper on the Geometrical and Mechanical Laws of Articulation, with the understanding that I was to be there in person. I wrote to two of the honorable body in regard to it, and was advised by them to decline and not be present at the Congress; that I had sufficient honor in having received an invitation. I asked the reasons for such advice. Their argument was that Bonwill was not a scientific man, nothing but a mechanician and inventor, and was working his brain for all he could get out of the profession. A third one, who was interviewed by another party for me, said that they did not wish to have any dentist who could not talk pure science; that at the International Congress in 1880 in London, and at Washington in 1886, the foreign dentists had proven too much for the Americans, and demonstrated their inferior ability in practical scientific work, and that no man would be invited before the Berlin Congress unless he was a good scientific man.

Sir Astley Cooper said that medicine is a science founded on conjecture and improved by murder.

And so bacteriology in dentistry has not yet saved the first human tooth from the ravages of caries, nor has it in the future any bright ray of hope that it will accomplish all that the scientific dentist would have us believe.

If working our brains over such hypothetical problems will make us scientific dentists, while we are permitting the teeth to go to destruction through our present practice, let us hail it; but, at the same time, we would do well not to ignore that true branch of science—mechanics—which has from the inception been the only fixed and certain basis of attacking and battling with caries. We cannot practise the science of dentistry when we attempt to throw overboard its sheet-anchor,—*manual labor*.

So long as we cannot save human teeth by the theory of "germ treatment," but are compelled to labor with our hands, we are doomed to be looked upon as craftsmen and no better than the trades.

The mere experimenter, without any definite results in any

line of work, is not a scientific man. Science is absolute and unchangeable. It is truth! It is an ultimate principle! There is but one result.

I would not have you understand that all experimenting in the secret chambers of nature should be denied. But what I do protest against is, that when scientific men have failed to save human teeth by certain known and acknowledged treatments and practices, they should assume to be the umpires to decide whether the present system, founded almost entirely upon mechanism, should be set aside.

When the teeth become so worn, where germs have had no part in the destruction, what can we look to as our alternative? Bacteriology?

The mechanical dentist is a fixture in our profession, and it would be well to make yourselves competent to be experts in your art, that you can stand in the eyes of the best of society on equal footing with the jeweller, diamond-setter, and cutter. The electrician could not do his work without the steam-engine to drive his dynamo.

The field of mechanical dentistry to-day is unique; and, while we have no system that has been universally adopted, we have done enough to place us as far on the record of progressive dentistry as has the so-called operative department.

While I am no friend to bridge-work as practised, yet it has taught a few men what we so much stand in need of,—manipulative skill.

Crowning has been one of the greatest steps in dentistry so far as pure artificial and mechanical work is concerned; but even this you will find has been most wofully abused by many of our craft, in cutting off the crowns of natural teeth that could have been saved with amalgam for years.

The truly competent dentist who is a born mechanician will seldom have to resort to a crown of any kind. The more we look at the subject will we find that dentistry is a medley, and no man can be competent to practise it who has not been educated in all its departments to do one as well as another.

What is it that will place us among the world's exemplars, and give to us, when dead, a place worthy to be remembered? One man from our ranks has been honored by a public monument, the discoverer of anæsthesia; and if it had been raised while he lived, I am not sure but he would have been abused that he did not give at once his discovery.

The first step to recognition by the public will be when we have, as I have intimated, sought truth for its own sake. Selfishness, envy, jealousy, and ingratitude can have no place in a body of men who labor for the general good. Let us be fair and, when one of our craft has given something original, and it proves a marked advance, place his name, while he lives, on the record. It will be in time a milestone in the records of dental history.

The next most important step is for the live men of our art to visit the great centres of trade and where machinery is developed, and watch the matchless system by which the minutest part is made, and also made interchangeable. Go into the draughtsman's department and scan each line and curve on that chart, where lies in perfect symmetry every portion of the huge engine to be born of that engineer's skill. Go and see it put together, and note whether every bolt and pinion does not fit with absolutely mathematical precision. System, order, conception, design, creation,—without these all would be chaos. Without the laws of geometry and mathematics, with a genius to carry these out and with the perfect system of "interchanging," and machinery adapted for every special piece, they would be as helpless as is the so-called scientific dentist of the day. I never enter a machine-shop of the simplest character that I do not feel a reverence for men who labor and wait for recognition.

We are very far from a system that will enable us to save, with our present means, the teeth that come to us for treatment. The "American System" had no head, and it entailed upon us much that was merely experimental, to fill pages and make volumes.

I think that it was an unfortunate procedure when Dr. was first placed as a title to our names. It is like a big solitaire diamond on the hands of a man who has to labor, whether in dentistry or the trades; he cannot keep his eyes away from it. Nor can he lose sight of the fact that his hand or finger must be placed so that every one else can see it. I appreciated it as much as any one when by certain laws of the colleges a diploma was given me, which I never looked at until the officer demanded it for registration. I would prefer to have on my sign, as on my cards, my simple name.

Professor Samuel Gross said to me, "Do not complete your medical studies at the Jefferson, where you have one course to your credit, for the purpose of being with M.D.'s. Go on in your own way, and do all you can to elevate the systems of practice. Patent what you have a right to, as well as M.D.'s who copyright,

learn to converse with M.D.'s intelligently on most subjects, particularly in dental practice, and I assure you that you will stand as high with us and better than a dentist who could talk medicine from the book, and with no practical experience to show in conversation."

My associates, I will not trespass longer upon your patience and feelings, but remind you that if you will but read over my article, you will find that, although not scientific, it points to the goal where we can see truth. Let us as a society, see what we can get together and place in order to show how far we are standing in the advance, and what its members have done, and place it in the Columbian Exposition, that we can measure, not swords, but the ploughshares we have made which will turn a sod that will, even when harrowed by opposition, give us a pride in our past work; and whether we are recognized as being the peer of any or forgotten, we have the consolation that

> "In doing is reward, and richest he
> Who labors not for time, but for eternity."

OPERATIVE FAILURES AND THEIR REMEDIES.[1]

BY EDWIN C. BLAISDELL, D.M.D., PORTSMOUTH, N. H.

Man is master over his method; in other words, one will produce a marked success, following a given method, where another will meet with failure, though adopting the same course, but will attain similar success with a method of his own. I am simply stating a few cases, where failures have been noticed in my practice, with perhaps a hint regarding a remedy.

First, we will consider oxyphosphate or oxychloride fillings. I seldom fill a cavity with one of these cements, without the protection of the rubber dam, producing as near as possible perfect dryness of the cavity; yet, whatever cement you use, if the cavity runs to or under the gum, it will not be uncommon for that filling to be a miserable failure, more especially if it is an approximal cavity in bicuspids or molars that are close together. As to the condition of the secretion of the gum, I am not prepared to say. Gutta-percha is not dissolved by the secretions of the mouth, whether alkaline or

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[1] Read before the Harvard Odontological Society, September 29, 1892.

acid, and under the margin of the gum makes one of the best stoppings we have. Would it not be better, where the cavity extends under the gum, to make that portion of the filling of gutta-percha, then the remainder of cement, and in that way avoid a common failure,—viz., a large approximal cement filling inserted some two years or less, as a capping for the pulp that may have been exposed? The filling looks well, but the patient complains of pain about that tooth. You proceed to examine with a fine explorer, and find a space between the tooth and filling, below the gum. The filling is removed, the cavity is much enlarged, the pulp often exposed, and what was intended for protection has been a playground for destruction.

We have just seen where gutta-percha performs an important part in the preservation of teeth. Now, I will try and show where it in turn is destructive. For instance, a large cavity upon the grinding surface of a molar, after being excavated, little more is left than the walls of enamel standing on four sides. Several years ago I filled a number of such cavities mainly with gutta-percha, covering with amalgam to prevent wear. Many of them returned in two or three years, with one side of the enamel fractured to the gum. In two cases there was no occluding tooth; it was, therefore, hardly due to mastication. In one case the fractured enamel was replaced with amalgam, and the patient dismissed, to return in a year with more enamel gone.

I can account for this fracturing in no other way than by a slight expansion of the gutta-percha, and think that these cases call for cement for the main body of the filling. If from the close proximity of the pulp you fear harmful results from the acid in the cement, use some quick-drying varnish over the dentine.

A word for and against copper amalgam. We all know how it will waste in some mouths, also the difference in waste in regard to its location. Upon the buccal surface it is seldom affected at the gum margin, but the nearer the filling approaches the grinding surface, the greater the waste. Large copper amalgam fillings placed upon the coronal and buccal surfaces is questionable practice.

Approximal fillings of copper amalgam when protected from wear by the adjacent tooth, and not running near the grinding surface, are, in my experience, much less affected by waste.

A notice of the combination of gold and amalgam can hardly come in my paper, which treats of failures. I have not seen as much of this work as many, but what I have done and what I have seen has given satisfaction, and I have yet to see a failure. Dr.

Clapp has demonstrated this method and the success of it many times.

A few years ago I heard a member of this Society state that, for an instrument to make undercuts, "Give me a good, sharp, square-cut hoe or hatchet excavator." In the preparation of all cavities we should avoid angles as much as possible. You would never think of having a right angle in the edge of a cavity, for we are taught it is a difficult place to fill, and liable to leak and produce decay. Now, the idea of having a groove, with two right angles in it situated behind an angle, and filling it perfectly, seems beyond belief. I have tried to fill such places, and in cases where the enamel was thin I have seen, after a year or two of use, two little lines, showing the width of the instrument used in making the undercut. It is as easy to have a convex cutting edge as one with right angles, and it will make just as good an undercut, and a groove much easier to fill perfectly. A round burr I think the best. The wall that has such a groove is less liable to fracture than one made by an excavator, the cutting edge of which is square.

The most innocent-looking instrument used by the dentist is probably the matrix. Yet how many who use some of the many forms think of the danger that lies hidden in them when working gold? The closer the matrix fits the tooth, the more trouble. Here we have the same difficulty as with the undercut, only in a more dangerous position. Is it not bad practice to use one of the many forms of matrices that are held in place rigidly by any form of screw or wedge? Much more durable would the filling be if the matrix was a simple strip of watch-spring steel, held in place by the fingers, or tied in place lightly by a piece of floss silk. The good principle of such a matrix is, that when pressure is given the gold, there is a slight give to the matrix, the gold is forced and condensed to a small extent beyond the margin of the cavity; then when the cavity is filled and the matrix removed, you have a chance to do more condensing around the edges with the burnisher, which adds much life to a gold filling.

Another trouble comes to most of us in working porcelain inlays. In selecting the color for the inlay, you use great care, and find one that is very near perfection. The inlay is ground, and tried in the cavity. You congratulate yourself you have now one that even a dentist will hardly find. The inlay is then cemented into the cavity, and the cement allowed to harden. You now experience a chill down your back when you behold your presumably perfect piece of work two or three shades off color and a

failure. I cannot give more than a hint towards the remedy. The trouble lies in the cement used, and will continue to remain there until some of us invent a transparent cement for such work.

The ways of working gold are many, and hardly will you find two dentists in the same office who use it in the same manner.

When we look at the work of some of our older practitioners, we find the gold fillings standing about as good as when first put in, except perhaps to the outward appearance they may look imperfect, and you judge that the fillings ought to be replaced; the old fillings are removed only to find the floor of the cavities in perfect condition. Such fillings of thirty and thirty-five years' standing are not rare. I have this summer seen six approximal fillings in the lower incisors that were inserted by Dr. E. S. Rider, of Portsmouth, in the year 1847 (forty-five years ago), and which are still protecting the cavities.

We all know that at that time soft gold was the only gold used and inserted by the wedge process. I think the philosophy of the soft gold lies in the fact that it so easily slides on itself, and takes the imprint of the wall of the cavity quickly when under side pressure.

I shall have to use the words of Dr. Gerrish, in his paper upon "Soft Gold," read before the Massachusetts Dental Society last October, when he asked, "Why does the farmer plug the tap-hole of his cider barrels with a spile made of pine, rather than some hard wood? Simply because he loses no cider, there being no leakage. For the same reason, a boat-builder stops up the holes made in his floors by the withdrawing of nails or screw, with soft wood. The plug must be softer than the material into which it is driven. When you place a soft-foil filling into a tooth, you have the same conditions present."

We all know with what extreme care a filling of cohesive gold has to be worked, what small pieces have to be used, and what the result is if there is the least rock to the first few pellets inserted.

In the use of gold there should be much judgment exercised which foil is to be selected. I think it safe to say that a cavity with four walls or more does not call for cohesive foil.

In speaking of the use of cohesive gold, I do not wish to call it a failure, for in its place there is nothing better, but we can save the teeth, and the patient and ourselves much valuable time, by using soft gold wherever possible.

There is one other point I wish to speak upon as saving time, and that is in shoeing teeth. Heretofore we have drilled two or

more retaining-points or inserted screws, then built gold up or down to the desired amount. Last January I had the pleasure of seeing Dr. Levi L. Howell, of Riverhead, N. Y., give a clinic before the First District Dental Society, and through his kindness will read his method of shoeing:

"1. Drill two retaining-holes $\frac{3}{32}$ of an inch in depth, each side of the nerve, with a No. 1 round burr. Be sure that the holes are parallel.

"2. Take a piece of platina and iridium round wire, five inches long, just a trifle smaller gauge than the burr; place it in a jeweller's hand-vise, allowing the wire to protrude three (3) inches; file a sharp point on the wire.

"3. Try the wire in one hole, and see that it goes in and out easily.

"4. Take a piece of pure gold plate, No. 32 gauge; cut a piece a trifle larger than the tooth surface you wish to shoe or cap; anneal this well; place it over the tooth, and with a very sharp-pointed instrument feel for and locate the hole you have prepared your wire for; when found, just puncture the gold.

"5. Take your wire and push it to the bottom of the hole; if your wire is of right size, the gold will lock around the wire, and when it is removed the gold plate will come away with it.

"Drop a trifle of Parr's flux around the wire on the surface you are to build up.

"Take as small a piece of eighteen-karat solder as you can cut, and place it alongside of the wire on the plate; hold this over a small alcohol flame, and solder; place it on the tooth, and gently burnish the gold to its place. When you cut the first wire to free your plate, be sure and leave it projecting as far as you wish to build up.

"Place the plate on the tooth, and proceed with the second pin the same as the first. If your holes are parallel, the plate will come away attached to the wire. Solder this pin the same as the other.

"Do not cut the wire; place the plate on the tooth, and burnish until it fits perfectly. Add a thin film of gutta-percha on the side of the plate that comes in contact with the tooth; warm slightly; place the plate back, and burnish again. This gives you a perfect impression of the surface you wish to cover. Trim your plate of its overhanging edge by the marking of the gutta-percha; remove the gutta-percha, anneal, and burnish. You can now see that your plate fits every part of tooth surface.

"Drop a morsel of Parr's flux on the surface you wish to build up; place a piece of eighteen-carat solder between the two pins; hold over the lamp till the solder runs; repeat this till you have built your plate up as far as you wish. The solder will always run to the top of the first pin.

"Clean out with muriatic acid; cut your second pin off; dry your tooth, and cement in place; when set, finish with sand-paper disks, stones, files, or whatever method is suggested."

By this plan we save much pain and time, producing a shoe that will stand the wear better than the best of cohesive gold work.

THE DENTAL ASPECT OF IT.

BY A. BETHUNE PATTERSON, M.D.[1]

In the June issue of the *Dental Cosmos* there is an editorial on the use of the lancet during first dentition. The writer labors to show the importance of more general information upon the conditions which call for the use of the lancet in teething, and deplores the ignorance manifested by medical men in anatomy, physiology, histology and pathology; and also in the etiology of disease, especially as it bears upon pathological conditions found in the jaws of teething children, which conditions, to the editor's mind, are responsible for many, if not all, of the diseases of infantile life.

He would force practitioners to accept his views by placing them before the profession as facts. He says in reference to the therapeutic value of the lancet, "this is simply a question of fact, regardless of any theories involved."

With this flood of light from the dental side, it is presumed that dentists and medical practitioners will supply themselves at once with gum-lancets, the panacea of all the ills of infantile life, or remain "culpable" and "ignorant" obstructionists to modern therapeutics. The editor continues: "Gum-lancing is a therapeutic measure of unquestionable value, relieving the pulp-irritation set up by backward pressure of the developing root. . . . But why, in the light of all that has been written on the subject from a dental stand-point, should any be ignorant? . . . Doubly culpable is a writer

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[1] Late Assistant to the Royal London Ophthalmic Hospital, and Golden Square Throat Hospital, London, England.

of acknowledged authority who condemns the operation of gum-lancing as a therapeutic measure."

The author referred to is F. Forchheimer, M.D., Professor of Physiology and Clinical Diseases of Children in the Medical College of Ohio, and a member of the Association of American Physicians and also of the American Pediatric Society, etc. This author condemns gum-lancing, and the editor of the *Dental Cosmos* "records a protest against the fallacies here promulgated, in the hope of preventing the serious consequences which must necessarily follow such antiquated teaching, an adherence to which is largely responsible for the high rate of infantile mortality." Exactly how our learned critic arrived at these remarkable conclusions and the "facts" is of great interest to practitioners of scientific medicine. Sections of the tissue in question properly investigated under the microscope reveal the only solution to the problem. And by this means only can a full explanation be given of that much-dreaded condition characterized by "unyielding and overlying gum-tissue." Hypertrophy and atrophy, and in fact all other morbid conditions of the cellular tissue, nerves, blood-vessels, can be understood only by aid of the microscope. It is to be inferred that the editor has not entered very far into the study of pathological dentition, for he says, "There may be produced a hyperæmia sufficient possibly to produce the protrusion of a part of the mass from the incomplete aperture of the root, giving abundant cause for extreme constitutional disturbance." This does not show that the editor is very confident in the position he has assumed. Again, we are informed that "in the adult, irritation of a dental nerve may give rise to otalgia, otorrhœa, deafness, amaurosis, hemicrania, neuralgia, hysteria, chorea, epilepsy, tetanus, and it is not only possible, but highly probable, that a like irritation may be the occasion of grave and even fatal disorders in the infant." What proof have we of such statements? Such conclusions would have claimed precedence some twenty years ago. But the great hurricane of progressive medicine has swept away such wild and speculative theories. I hold that it is not in good taste, neither is it fair, to brand practitioners and "authors of high authority" with deplorable ignorance, and especially is this out of taste in an editor who guards his opinions and expressions with such terms as "may be," "possibly," "highly probable," etc. Such opinions the editor expects medical men to accept as a lucid explanation of the pathological condition which in his mind is responsible for the present high rate of infantile mortality.

It is upon a clinical and scientific stand-point, keeping before me the laws of modern pathology, that I venture to take issue with the learned editor. Research in the etiology of disease has opened the way to a clear understanding of at least some of the pathological conditions. The investigations have led us into the field of bacteriology. By the study of micro-organisms we have accounted for many phenomena which before could only be speculated upon.

In considering gum-lancing, the question of inflammation cannot be ignored, neither the so-called "reflex neurosis,"—a bulwark behind which a vast amount of ignorance takes refuge.

To enter into a discussion of a number of diseases that are daily sending the little ones to an untimely grave is not the object of this paper. A brief reference to only a few of the fatal diseases of children will prove that pressure upon formative pulp cannot be the "occasion of grave and even fatal disorders in the infant."

Mothers and doctors have been bothering themselves for ages about nature's way of getting out teeth. Nearly all the morbid conditions of this period have been traced to this physiological process. Swollen and inflamed gums have attracted the attention of the illiterate as well as the educated. So common is this pathological condition, accompanied by grave enteric and nervous disturbances, that they have been readily associated as cause and effect, and many have been the arguments knit together to satisfactorily demonstrate the plausibility of the theory.

Medical men are agreed as to the etiology of inflammation. This pathological condition has its origin in micro-organisms. It would be a waste of time, too, in the light of what has been developed from a medical stand-point, to offer proof of this statement. Swollen and inflamed gums are not alluded to in the editorial as characterizing "pathological dentition," and as these signs are the only evidence of a morbid condition it is necessary that they be carefully considered. There are two ways by which bacteria find their way into the tissue in question,—through the circulation and through the buccal cavity, which cavity is the habitat of several different species of bacteria. While some of them appear to be harmless, others are inflammatory. The latter find their way into the gum-tissue by accidents which are traumatic in character. The disposition of an infant to bite on any hard substance that it can get in its mouth is due, in my opinion, to the itching sensation which results from external pressure compressing the nerves supplying the intervening and absorbing structures. This is an invariable and constant condition. Mothers and nurses, eager to supply every

apparent comfort and whim, have confidence in rubber rings, knife- and tooth-brush-handles, friction and pressure upon the overlying gum, as a means of assisting the exit of the teeth. Thus supplied with the would-be auxiliaries, the infant, unmindful of the consequences, comes down with too much force, with the result of a rupture of the epithelium and underlying tissues. Fissures are thus formed through which pyogenic germs find their way into the underlying structure, the cells of which have already been crippled by the traumatism. At once the operation of development commences which is signalled by the common evidences of inflammation,—viz., redness and swelling, etc. Another way by which inflammation is frequently set up is as follows: In the cutting of a molar, one of the cusps makes its appearance before any of the others, leaving an overlying flap which forms a pocket for the reception of particles of food, accompanied by inflammatory germs which here find conditions favorable to development. The result is inflammation. This condition calls for a lancet, the indications being those of an abscess. The resulting hemorrhage would wash out the bacteria and foreign matter, and relief would follow.

The editor, strong in his faith in "the light that has been developed on the dental side of this question," is uncompromising in his belief that "the present high rate of infant mortality is due to the irritation of the dental nerve set up by backward pressure upon the formative pulp." He is confident that his learned colleague—Dr. J. W. White—has proven conclusively that "in the adult the irritation of a dental nerve may give rise to otalgia, otorrhœa, deafness, amaurosis, hemicrania, neuralgia, hysteria, chorea, epilepsy, tetanus," etc. Dr. J. W. White concludes: "It is surely not only possible, but highly probable, that a like irritation may be the occasion of grave and even fatal disorders in the infant."

Reasoning from this stand-point, it would be logical to conclude that the gratification of the infant to bite on hard substances would increase the backward pressure, thus increasing the "distressing symptoms," and the diseases incident to first dentition, especially fits, diarrhœa, cholera morbus, etc., would be intensified.

In the study of the cause of disease at the present day we find bacteriology and pathology moving along hand in hand dispensing light, the rays of which are daily penetrating the hovel as well as the palace, carrying comfort and good cheer. The observations of pure cultures of micro-organisms in the tissues of animals, as well as in the tissue of human beings, have demonstrated conclusively the part they play in the cause of disease. So no doubt remains in the

minds of medical men as to the cause of tetanus, cholera morbus, and the various forms of diarrhœa. Bacteria of a well-known shape, having color which is reflected in the characteristic green stools of teething infants, find their way into the alimentary tract and are responsible for the enteric troubles which help to swell the high rate of infant mortality.

Further comment upon modern etiology would be akin to supererogation, and, as a parting word to our dental editor, must say we will regard with reverence the "light" that has been developed on the dental side of the issue as a beacon, warning us of dangerous ground upon which the fondest hopes have been wrecked, and to say we are now headed for that revolving light in mid-ocean of progressive medicine, a field which, when diligently cultivated, yields a harvest rich in good to suffering humanity.

THE LAW OF HERITAGE IN REGARD TO THE TEETH AND JAWS.[1]

BY HENRY S. CHASE, M.D., D.D.S., ST. LOUIS, MO.

THERE should be perfect harmony between the human teeth and the human jaws. Natural evolution of a race would at last produce this condition.

Naturalism is only the last term of a series, the first of which were inharmonious, and the succeeding ones less and less so, by the elimination of individual beings from the continuous line of descent. The free breeding of human beings on an island, or in an isolated country, would at last terminate in harmony between teeth and jaws, for adaptations to environment would continuously proceed until a level of agreement had been reached.

Fifty years ago I lived among a savage tribe of Indians in the then Northwest Territory, and now the State of Iowa. These people were called "The Sacs and Foxes." Their teeth were white and "even;" they were not crowded.

The "Winnebagoes," who inhabited a near-by portion of this country, were often seen on the "neutral grounds," and their teeth also were observed to be perfect.

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[1] Read before the American Academy of Dental Science, Boston, June 1, 1892.

Naval expeditions for exploration of the islands of the world fifty and one hundred years ago, commanded by Cook and Wilkes, found the natives of the Pacific islands to possess perfect teeth as to beauty, soundness, and harmonious position in regard to each other and the jaws.

Why do the dentists of the United States find an entirely contrary condition in the patients whom they have to treat? It is because the American people are not a fixed breed. They are not yet Americanized.

Germans, Russians, Swedes, Polanders, Hungarians, Irish, Scotch, English, French, Italian, Spanish have divided their reproductive life-germs with each other, and produced children which will in some future time evolve a grand race of human beings. But this universal crossing of breeds without reference to the law of heritage is confusing enough to the scientist, but an utter despair to the mere student of the "practice of dentistry."

The dentist who has studied the science of heritage sees crowded but undecayed teeth in the mouth of a tall and beautiful girl of twenty years.

"Has your father sound teeth?"

"Yes."

"Has your mother sound teeth?"

"Yes."

"Are the teeth of your father regular and not crowded?"

"Yes."

"Are the teeth of your mother regular and not crowded?"

"Yes."

"How, then, is it that your own teeth are so dreadfully crowded?"

"I don't know. I wish you to straighten them."

The dentist continues: "Please let me ask you some questions. Where were your parents born?"

"My father was a gentleman's game-keeper in Germany, and my mother was the daughter of a shop-keeper in Paris."

"Is your father a tall, large man?"

"Yes."

"How is it with your mother?"

"Oh, she is very *petite;* she is only up to papa's shoulder."

Now, the man of science understands this. The girl has inherited the "locomotive system" of the father and the "vital system" of the mother. *Consequently she has inherited the teeth of her father and the jaws of her mother.* The father's teeth are large, and so are his jaws, and so there is harmony. The mother's teeth and jaws

are small, and so in harmonious proportions. The law of heritage compels the jaws to go with the vital system. It also compels the teeth to go with the locomotive system. Thus large teeth are liable to grow in small jaws and small teeth in large jaws. The "locomotive system" gives the height of a person, and the "vital system" gives the rotundity of the person, including thus the organs of nutrition. This young lady is tall because she has her father's locomotive system, and she is thin because she has her mother's vital system. It is impossible for this father and mother to have a *petite* grown-up child.

Now, if this young lady has a sister not like herself, this sister will be just the opposite in conformation. For she will be short and rotund. She will have the height or "locomotive system" of her mother, and the rotundity or "vital system" of the father. Thus she ought to have small teeth in large jaws. On inquiry I found this to be true. "My sister has too much room for her teeth; her front teeth are too far apart." Further: "She is as short as my mother, but stouter." Further: "No, we do not look alike in form or feature, but we both look some like our parents, and it's funny." Now, you may see that if her mother had been short and stout, this young lady would have been of immense size,—"tall and big."

The dentists of America will, for a hundred or two years yet, have to deal with "irregularities," for hap-hazard marriages will still continue to take place, until the majority of people are educated in the law of resemblance and transmission of organizations. Nothing but "organization" is transmitted. There is no such thing as "blood" in breeds of beasts or humans. Either parent may give either the locomotive or the vital system. But one parent cannot give both systems. Each parent gives a defined half of the new being. Indeed, a definite half of himself or herself unite in the marriage of reproductive germ-cells to produce a child.

In the practical study of this subject we are confronted with "exceptions" to the law. If we had greater knowledge, discernment, perhaps we would understand that the "exceptions" are only seeming, and that an unseen factor is a part of the law of modification in "heritage." Perhaps "atavism" is the factor, recognizing by that word the persistent reproductive life-force from former generations.

The Indians of whom I have spoken were a pure breed of humans, *fixed* in their characteristics. Marriage out of their own tribe would only take one from the same family, and belonging to

the same race. This is sufficient reason for harmony between their jaws and teeth.

This great family extended from the thirty-second to the forty-sixth degree, and from the Rocky Mountains east to the ocean.

Reports of Society Meetings.

NEW YORK ODONTOLOGICAL SOCIETY.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, October 18, 1892, at the New York Academy of Medicine, No. 17 West Forty-third Street, New York City.

The President, Dr. Woodward, occupied the chair.

The minutes of the previous meeting were read and approved.

INCIDENTS OF OFFICE PRACTICE.

Dr. Littig.—I have here a little device which I call the cotton-brush. It is simply made from an ordinary pen-holder and has a wire aluminum screw. I have found it very serviceable in cases where the gums have been very much congested and extremely tender, and in such cases children particularly dislike very much to have their gums brushed with a bristle-brush. These cotton-brushes, which simply consist of twisting a piece of cotton around the screw, clean the teeth very nicely indeed. Of course, the cotton is thrown away after it is used.

I have used these brushes for about eighteen months, and have found they worked very well. Take a piece of cotton and twist the screw, and it winds it on tight, and gives a simple method of carrying an astringent or anything else you want into the mouth. In every case where I treat pyorrhœa alveolaris, I give the patient one of these, and tell him to dip it in listerine, or whatever else I recommend, and rub the gums well.

Dr. B. C. Nash.—I would like to relate an incident in my practice, with the idea of drawing out the opinion of the members of this Society. A young miss of thirteen years presented herself, and I found that all of the deciduous teeth had been shed except the

right superior second molar. Inasmuch as all of the bicuspids were in position except one, the place of which was occupied by the temporary tooth, I concluded to extract it; but after doing so I failed to find the expected bicuspid under it. The question at once assumed a somewhat serious phase, and I wondered if I had used poor judgment in extracting the deciduous tooth. I did it with some confidence, having had a somewhat similar experience in the case of a young man of twenty-one years, for whom, however, I was able to positively determine the presence of the bicuspid before extracting a temporary molar. My decision was also influenced by another case, that of a lady nearly thirty years of age, who still retains a temporary molar, and the bicuspid which should occupy its position has erupted inside the arch. I have heard the opinion expressed by men of prominence that they would not hesitate to extract under circumstances similar to that I have related. I think it is a question for discussion.

Dr. Carr.—Was this molar firm?

Dr. Nash.—Yes, tolerably so.

Dr. Littig.—I have seen so many cases where the temporary teeth have remained almost during a lifetime, that I do not know whether we would be justified in extracting them, under the circumstances. If the arch were very much crowded we could do so, but for the sake of making the bicuspid erupt, I doubt very much whether it would be the best thing to do.

Dr. Nash.—I may say that I have heard expressed the opinions of Dr. Clowes and Dr. Tennison, that they would not hesitate to extract the teeth under those circumstances.

Dr. William Carr then read a paper entitled "Treatment of Fractures of the Maxillæ," illustrating the same with models and appliances.

(For Dr. Carr's paper, see page 849.)

Dr. Carr.—If in using the Gibson or the wire splint there is muscular resistance, the reducer invented by Dr. John Meyer, of this city, is indispensable. I have previously objected to using Dr. Gibson's splint on account of the external appliance. But Dr. Gibson assures me that the external portion may be removed with safety to the patient during the day and readjusted at night. In that case the fact of permitting the patient to masticate is of great importance. I have had a set of these splints made, and expect to treat my next case of fracture by this method.

Dr. Bishop.—I have had some experience in this line of late years. I have seen a great many cases of fractures, from a blow,

from a runaway, from a railroad accident, from a gunshot, from an explosion, and from lightning, and it takes lightning to do the work. I think that it was not only a double and compound fracture, but it was quadruple, and seemed almost too much for a human being to treat.

In all cases that I have seen a simple interdental perforated splint put on the teeth would suffice, and there was no use for the external splint. Dr. Gunning used this splint in 1862, and when it was in the mouth it was received very kindly. The powerful muscles act as an external bandage, and will do all the work necessary. It is very difficult sometimes to make a correct diagnosis. I know of three such cases. A few years ago there was a group of gentlemen standing on the steps of the State House in Boston. One of the gentlemen fell in a fit, and pitched forward on the stone steps. He was carried to his hotel, and was examined by a number of very eminent physicians, who pronounced his injuries fractures about the mouth and jaw; but after a few days, when the bruises and swellings had gone down, it was found there was no fracture whatever. A very prominent man of this city was riding up-town in a Fifth Avenue stage, and as he was getting out, the stage started suddenly and he was thrown forward. He fell on his face, and after being helped home he sent for his surgeon, who pronounced his injuries fractures of the condyles, and put on an external four-tailed bandage, and told him he would have to keep quiet; but his brother-in-law, who was a patient of Dr. Gunning, sent for him. The result of the consultation was that the bandages were removed, and two days afterwards the gentleman went to his business.

Another case was that of a boy who was badly crushed in an elevator accident. A very prominent surgeon in Bellevue Hospital said there was a fracture; the case was postponed for a day or two, and it was found that there was no fracture whatever.

A surgeon in treating a bone of the leg or the arm can get around it; but in the lower maxilla he gets on the wrong side of it; we, however, can get on the right side of that bone, and we make the muscles and the interdental splint do the work, and, as Dr. Carr says, a man may not even be detained from his business, but can go right along, and the bone unites and makes a perfect union.

Dr. Carr.—Don't you think that the surgeon gave the proper treatment in putting on the bandages, in the case that you mentioned?

Dr. Bishop.—I think not.

Dr. Carr.—Was not the object of the bandage to keep the muscles at rest? Was not that good treatment?

Dr. Bishop.—No; I don't think so. Sometimes you displace a fracture very much by external bandages.

Dr. Littig.—In regard to fractures of the superior maxilla, they are a matter of little moment, so far as I can see, and it takes very little to keep them in position. The first case of that kind that I ever had was one of an old lady who was wearing an artificial set of teeth, and by falling she struck the side of her face against a silver tea-pot which she was holding in her hand. When I saw her, the alveolar ridge on the right side was in about the centre of the mouth. She was bleeding quite profusely, and I sent for some styptic cotton and applied it, which arrested the hemorrhage. She had a considerable cut on the cheek, which I drew together with adhesive plaster. Tincture of calendula was recommended as a wash for the mouth, and I told her to wear her plate, which she did. Although she was almost eighty years old at the time, there was perfect adhesion of the bone, and she was able to wear her teeth just the same as ever. As Dr. Carr said in one of his cases, it is very peculiar that in the fracture the pulps of the teeth were preserved alive. Usually a blow of such great force would destroy them. In that case the blow must have been so much above the points of the teeth, that it carried the alveolus and the jaw-bone right over, and did not destroy the pulps.

Dr. Davenport.—Is plaster ever used in taking impressions?

Dr. Carr.—Yes, but I never use it in these cases. I find that I can take an accurate impression with the compound.

Dr. Bishop.—If I may answer that question, I would say that I should take it, by all means, in plaster. The compound or wax makes too much pressure. If you have the right cup and oil it, and let the plaster stay until it gets thoroughly hard, you can then remove your cup, and the plaster is still in place. Now use a lance-knife and cut through the plaster to the tooth, then down the side of a canine or bicuspid, then with a chisel it is easily broken and removed in sections; when placed back into the cup you have a perfect impression. The trouble is, it fits too nicely. In vulcanizing the splint, use tin-foil over the cast, thus producing greater freedom in getting it into place.

Dr. Hill.—Is your only objection to the compound the pressure that it causes?

Dr. Bishop.—Yes; Dr. Gunning had in his day seven different sizes of jaw-cups made. They are deeper than this splint that Dr.

Carr has shown us, and larger. As already stated, you can fit those to your jaw, lower or upper, very nicely; then by oiling the inside, and using the plaster very soft, you will not cause any pain by pressure. You will find these sections of the impression go right back into the cup.

Dr. Gunning's idea was that you might use gutta-percha in the same cup, after getting your cast, and thus make a splint of it; but I prefer to use vulcanite splints, perforated so that when they are in place the tongue and the muscles of the cheek are constantly passing fluids through, and with a brush they can be kept very clean.

Dr. Carr.—Does not the gutta-percha splint become very foul in three or four days?

Dr. Bishop.—Yes; that is the objection, but with the vulcanite splint it is very sweet. These cups are very useful in taking impressions of the lower jaw.

Dr. Perry.—I do not know that I ought to bring this subject before the Society, but I wish to say a few words. I received a letter from Dr. Barrett, in which he asks permission of the Society to have published an address which he made at the dinner given him on the presentation of the osteological collection now in our rooms. He would like to have the official sanction of the Society to have the paper published in the *Dental Review.*

On motion, privilege was granted to Dr. Barrett to have the address published.

After a vote of thanks had been tendered to Dr. Carr for his interesting paper, the meeting adjourned.

JOHN I. HART, D.D.S.,
Editor New York Odontological Society.

AMERICAN DENTAL ASSOCIATION.

Second Day.—Morning Session.

(Continued from page 836.)

THE meeting was called to order by the President, Dr. Walker. The minutes of the previous session were read and approved.

Dr. W. C. Barrett, of Buffalo, then read a paper, entitled "A Brief Study of the Molar Teeth of the Proboscidiæ," of which an abstract follows:

"The student of comparative dental anatomy nowhere, in all the broad realms of nature, finds better opportunities for study than in the teeth of the Pachydermata, or thick-skinned animals, a subdivision of the great order of the Ungulata, and in which the Proboscidians form a suborder. In tracing the modifications of dentition through the different species, it must be remembered that a number are lost, and the regular gradations do not appear.

"But in the pachyderms, as they now exist, or have existed within comparatively modern times, modifications may be traced which are a sure indication of the gradual development of certain species through the lapse of cycles of time. We find families which in their dental development seem to the ordinary observer as widely separated as the East is from the West, but which a close examination proves to be near congeners.

"What analogy, for instance, is there between the tapir, the last remnant of a great Eocene family, with its forty-two teeth in full use at one time, and the elephant, the final existing species of the almost extinct Proboscidians, having only six? And yet the gradations are plainly indicated. The molars of Tapirus have distinctly cone-shaped divisions of the crown. In the Dinotherium these are also found, but the separate denticles have united, and the cone-shaped prominences have become sections, each having its separate root. There are modifications of this change found in certain intermediate forms, which indicate the process of union of the separate teeth, showing that both dentitions had the same common source.

"In the fossil mastodon, named from the shape of its teeth (*μαστὸς*, a nipple, and *οδούς*, a tooth), we find the same general form of dentition, but materially modified as to structure. Finally, in Elephas there is a yet further modification, the cone-shaped prominences being lost, and the separate denticles taking the form of dentinal plates. The structure, too, is changed, but there still remains the body of dentine surrounded by enamel, the whole being united by cementum, the modifications being those which would be induced by the gradual change of the denticles into dentinal plates.

"The six incisors of the tapir we find reduced to four in the mastodon, and of these the inferior ones are rudimentary, while the superior permanent pair, finding no lower ones with which they might occlude, grow to an enormous size and are developed into tusks, precisely as the incisor teeth of rodents grow to a great length when the opposing one is lost by accident.

"In the Dinotherium it is the superior incisors which have become rudimentary, and the lower ones are in the same manner

developed into great tusks, preserving their natural outward curvature. In the elephant the incisors follow the law of its congener, the mastodon, keeping the natural curve that is imparted to them by the shape of their sockets, and develop into those enormous tusks that distinguish the species. The study of the incisor teeth of the elephant is a fascinating subject, but the limits of time demand that I should confine myself mainly to a consideration of the molars. Dr. Miller, in the *Dental Cosmos*, has given a very valuable series of papers upon the development and certain pathological disturbances in the tusks of elephants, and to that let me refer the student who desires something further in this direction.

"The dentition of *Mastodon giganteus*, of North America, is a distinct modification between that of the Dinotherium and the elephant. A part of the molars are succeeded by vertical successors, as is usual in the diphyodonts, so that there are, strictly speaking, true premolars. The denticles which make up the compound tooth follow the general law in mammalian tooth-structure, and are formed of a body of dentine covered by enamel, with a root-envelope of cementum.

"In the molar of the true elephant we find a remarkable modification, not only in structure, but in development. The succession, instead of being vertical, is horizontal. The formula is as follows: $\frac{2-2 \text{ m. } 6-6}{0-0 \text{ m. } 6-6} = 28$. Of the incisors, two are deciduous, while the permanent ones form the great tusks. The molars of the elephant are of great proportionate size, especially those which make their appearance later in life. There is never but one on each side of the jaw in full use at any time, and all through life there is going on the constant process of the shedding of this and the formation and advance of its successor from behind. The food of the elephant is of an exceedingly coarse character, and although the structure of the molars is such as to offer the greatest resistance to attrition, yet no other form of dentition would be sufficient for the long life of the animal.

"The germs of the six molars on each side of each jaw exist within the body of the maxillæ, and are developed in turn as the predecessor is worn out and shed. The structure is very complex, and is shown in the chart which I exhibit. The teeth are made up of transverse, perpendicular plates, which are developed separately within a crypt in the jaw. The size of these plates depends somewhat upon the age of the animal. I exhibit to you the bisected jaw of an adult elephant, and as I open it you are able to see the

crypt or chamber which contains these developing plates. Each of them consists of a body of dentine, surrounded by an enamel covering. The development is from these elevated points, as shown in this figure, which give to the forming plates a serrated appearance, not unlike that sometimes seen in the newly-erupted incisors of children. These plates are open at the base, the cavity being occupied by the pulp-tissue from which the dentine is developed.

"I have not had the opportunity to examine any fresh specimens microscopically, so that it is impossible for me to say in just what manner the enamel is formed; but as that tissue covers the whole plate, and as during the process of formation these are separated by a considerable space, it is probable that there is a separate enamel organ for each one, and that this continues its function to the time when the plates coalesce into the complete tooth. In the rooms of the Odontological Society of New York there is the complete skull of an elephant, the jaws bisected as are some of these now before you, but in which the separate plates are in a more advanced condition than are these, and which therefore more fully illustrate the formation, in that the plates are perhaps three times as large as are the ones I now show you.

"The growth of these plates continues until the enamel membrane is exhausted, when there is, from the several divisions of the pulp, a further deposition of dentine, which forms a strong base for the whole, uniting the plates into a solid body. As the tooth after eruption is worn away, roots are developed, which serve to retain it in position. In its earlier stages it is held by the great body being within the socket.

"Coincident with the formation of the great body of dentine at the base, the enveloping membrane begins the deposition of cementum between and about the separate plates, thus uniting their upper portions into a solid body as the dentine unites the base, and in this manner is formed that complex structure illustrated in the diagrams exhibited, as well as by the numerous prepared sections upon the table before me. There is, then, here in the centre of each plate, a body of dentine surrounded by a complete ring of enamel, and uniting the separate plates a stratum of cementum, thus presenting a yet more perfect arrangement of alternate dentine, enamel, and cementum than is found in the molars of the more common Graminivora. The several tissues offering a different degree of resistance, the teeth are worn into the alternate ridges and depressions that offer the most perfect surface for the proper comminution of coarse food.

"As the deposition of the enamel about the body of the dentine in each separate plate proceeds, it assumes a wavy or undulating appearance. In the Indian elephant, and in the extinct Mammoth, the sides of the enamel-walls are parallel, thus causing the enamel to present the appearance of a complete and regular ring. In the African elephant the body of the dentine is much thicker in the centre, and the enamel covering is expanded until there may be a complete separation in the middle of the ring, giving to the dentine a lozenge shape, and to the enamel of each lateral half of the tooth a zigzag appearance. This is very apparent in some of the teeth now before you, and by this peculiarity of structure it is comparatively easy to determine to which species each belonged. In the Mammoth the plates are thinner and more numerous, as may be observed in this specimen.

"In the procession of the teeth, a part of the posterior one comes into use before its predecessor is thrown off, for the whole process is a gradual one. While all the posterior plates are covered by the gum and bony tissues, the anterior ones are in use. Here is a tooth in which it may be seen that the first three or four plates are considerably worn, while the posterior ones bear no such marks. In the lower jaw the forming teeth lie within the ramus, while in the upper they are within the retreating portion. In the course of their descent, therefore, following the general contour of the jaw, they describe the arc of a circle, instead of advancing in a straight line. This peculiar conformation, therefore, presents the anterior angle of the tooth first. As it gradually descends from above and reaches the plane of the body of the jaw, the tooth assumes a horizontal position, and the successive plates are brought into full use. Before its eruption it stands almost at a right angle to its predecessor.

"This peculiar method of progression forms one of the most striking characteristics of the dentition. It brings the plates successively into use, and by the time the last one is in full action the anterior ones are considerably worn away. The tooth will then have a wedge shape, and its anterior border would have but a comparatively slight hold in the jaw, were it not that this is compensated by the development of the anterior roots. In the course of the attrition the foremost plates become worn down to the dentinal base and are smooth, while the posterior ones yet have their enamel intact. This serves a useful purpose in mastication, for, as Owen remarks, the coarse limbs and twigs of trees are broken up and crushed on the anterior smooth plates, and thoroughly comminuted between the deeply-ridged posterior ones.

"When the tooth becomes worn down so far that the basal mass of dentine is seriously interfered with, the pulp seems to lose its functional power, and becomes exhausted. A reversal of the process now sets in, and there is resorption of the roots, until the advance of its successor crowds it forward and finally out of the jaw, the other taking its place. This process is repeated in the several teeth until the last one appears, and this is sufficient for the needs of the animal until it dies from old age.

"Each successive tooth presents an increased number of plates, and therefore lasts for a longer time than its predecessor. The sixth molar seems to develop more slowly than any of the others, and to have an unusual number of plates, which come into use with increasing tardiness. It would seem that in an animal that lives to an extraordinary age the plates are continually added, that the tooth may serve for mastication until death. Here is such a one. The animal to which this belonged was probably considerably past the half-century mark, and yet it will be seen that there are many years of service left in the organ. While the first plates show the attrition produced by actual use, the last ones are yet in the process of formation, being quite immature. Of the twenty-odd plates, only ten have as yet been brought into action, and some of these are not worn down to the solid enamel. There was here a dental provision for many years of life.

"I have here the skull of a young Indian elephant, in which the points of the deciduous tusks are but just discernible. The exact age of the animal I have not been able to determine, any further than by the appearance of the skull. But it will be observed that the tissue around the extremities of the tusks is in a cartilaginous condition, and that they had not yet protruded through the gum, which should occur between the fifth and the sixth month. Yet the first molar is completely erupted, and shows some attrition, so that it is probable that the young animal at death was three or four months old. The bones of the head, while firmly united, are yet very frail, and the zygomatic processes but partially ossified. The first molars, which cut the gum in the second week, with portions of the second, are plainly visible, and illustrate the formation of the teeth very perfectly.

"In the upper jaw the first molar has six plates, while in the lower there are seven. The anterior plates of the second molar were not yet erupted, but they are completely united by cementum, while the posterior ones are only held by the dentine at their base. The crypt for the third molar may be distinctly observed, although

the plates are not sufficiently developed to be plainly seen. But the progression through the arc of a circle is beautifully illustrated, and the manner in which they are brought into use.

"Owen says that the first molar, which is in complete use at three months, and is shed at about two years of age, usually has four plates, but in this specimen there are more. The second molar, according to the same authority, has eight or nine plates, and that is about the number in this. He gives the length of the first molar at less than an inch, while in this specimen they are fully two inches. The second molar, he says, is about two and a half inches in its antero-posterior diameter. In this skull, although not fully developed, it is more than three inches. It may thus be seen that there is no determinate number of plates in different individuals, but that it varies with the development.

"The third molar has from eleven to thirteen plates, and is shed during the ninth year. The plates of the fourth molar number fifteen or sixteen, and it is shed from the twentieth to the twenty-fifth year. The fifth molar has from seventeen to twenty plates, and is probably not shed until the sixtieth year. Thus the first molar lasts but about two years. The second remains about four years, the third about the same time, the fourth eleven or twelve years, the fifth thirty years, while the duration of the sixth has not been definitely determined. The plates of the sixth molar are from twenty-two to twenty-seven, and it is from twelve to fifteen inches in length. . . .

"The advance in the grinding teeth is accompanied by a like advance in the alveolus, which is developed with them. The tooth, as it emerges from the body of the jaw, is enveloped in the cancellous bone which forms the socket, and as it moves forward there is a corresponding progression of the alveolus which retains it, and which is finally resorbed with the roots of the teeth as they reach the most anterior point, thus allowing their final removal. At the same time there is a new formation about the succeeding molar, which passes through the same stages. It would be difficult to conceive how the progression of the teeth could be accomplished by any other means.

"Although there are no deciduous molars, the elephant is provided with milk incisors, or tusks, which grow to the length of but a few inches, and are shed between the first and second year. They are almost immediately succeeded by the permanent ones, which, arising from persistent pulps, like the incisors of the Rodentia, like them continue to grow through life.

"Abnormities in the development of the teeth of these great mammals are not unknown. Especially are the incisors or tusks liable to irregularities. Not infrequently is their direction changed, through some injury to the alveolus. I have more than once seen captive elephants, the points of whose tusks crossed each other. Occasionally one tusk is considerably more elevated than the other. To a certain extent they are movable in their sockets, and a continuous pressure upon them will change their direction and relative position. These irregularities may be corrected, when the animal is not too old, by any force continuously applied, precisely as the human teeth are made to assume new positions by artificial means.

"In the rooms of the New York State Agricultural Society, at Albany, is the skeleton of the celebrated Cohoes mastodon, which was dug up some years since. The inferior jaw shows the loss of one of the molars, probably through some accident, and the alveolus has completely closed over the place. Probably the animal was not a very old one, but there are no signs of another molar beneath it. If it were possible to make a section of the jaw, perhaps something of interest might be discovered. I noticed this peculiarity some years ago, but have never seen it mentioned by any author. I have not had the opportunity to make a very thorough examination of the case, something which I propose to do in the near future.

"The most singular malformation that I have ever observed in any animal appears in the upper jaw of the celebrated elephant 'Jumbo,' which was killed in a railroad accident a few years since. This was an African elephant of prodigious size, although it had scarcely reached the age of full maturity. Captive African elephants are rare, the most of those in menageries being of the Asiatic species. The skeleton of 'Jumbo' was mounted at the Natural Science Establishment of Professor Henry A. Ward, of Rochester, N. Y., for Barnum & Bailey, the showmen proprietors of 'Jumbo' when alive, and is deposited in the rooms of the Society of Natural Sciences, in Central Park, New York City. I visited the skeleton a few months since, and called the attention of the superintendent to the many points of interest it presented, suggesting the advisability of an examination by making sections of the jaw. I was informed that as it was not the property of the Society this could not be done, but they would endeavor to obtain the necessary permission of Mr. Bailey to do it.

"I exhibit here casts of the upper jaw, obtained when the skeleton was mounted in Professor Ward's establishment. It will be

seen that the aberration was remarkable. There are two molars in each jaw fully erupted. At his death 'Jumbo' was about twenty-five years of age, and this would make of these the fourth in succession, provided the usual rate of progression had been followed. Yet Owen and Corse say that the fourth molar has about fifteen plates, while these have but ten. The same authorities give the length of the tooth at about eight inches, and that is the size of these. So we may probably accept them as the fourth molars.

"None of the visible teeth occupy their normal positions, nor are any of them of the usual form. The right molar is nearest the normal, yet this is curved considerably, the convex surface being outward. Instead of lying longitudinally in the jaw, it stands at an angle of about thirty degrees. The plates, however, are normally developed.

"Lying inside the posterior half of the tooth, and at nearly the same angle with the jaw, are the first five or six plates of the succeeding molar. In the plaster cast it is difficult to determine just what was the situation, but the plates were markedly distorted, some of them lying almost longitudinally, instead of transversely. Those which were not yet fully developed were on a still different plane, the posterior half of the tooth standing at an angle to the rest. Only a section of the jaw would reveal the exact manner of their formation.

"The left fourth molar presents a still greater anomaly, the convex side being inward. At about the junction of the fifth and sixth plates the tooth makes a sharp bend, the posterior plates standing at an angle of nearly ninety degrees to the rest. The developed portion of the left superior fifth molar presses against the deflected posterior plates of its predecessor, in such a manner as to tend to turn it upon its axis. The plates of the fifth molar are irregularly developed, the first and second being nearly an inch apart, and the others separated by a very wide layer of cementum.

"The general aspect of this case is that of the irregular development of the fifth molar without the removal of the fourth, and the malposition of all of them. The fourth molars are worn, the anterior plates being almost reduced to the dentinal base, but there has not apparently been the usual absorption that should take place at this time. The alveolus, especially upon the right side, has been extraordinarily developed, as might naturally have been expected. Those who closely observed the animal in life could not fail to mark the asymmetry in the jaws. I myself noticed it long before I had an opportunity to study it.

"What was the cause of this irregularity? The elephant, although not born in captivity, was captured when very young. He was of extraordinary size, and his whole bony system was unusually massive. He had always been of a peaceful disposition, and had not, until his death, met with any serious accident.

"A duplicate cast of the jaw was sent to Professor W. H. Flower, director of the Natural History Department of the British Museum, author of "The Osteology of the Mammalia," etc., and perhaps as competent authority as now lives upon the subject. He gave his opinion in a letter, in the course of which he says,—

"'The irregularity has arisen evidently from his food not having sufficient gritty particles in it to cause the required and normal wear of the front ones, so that these were not gotten rid of, as they ought to have been, before the others came up to take their places. Elephants in menageries constantly suffer in this way. They ought to have a little sand mixed with their food.'

"Notwithstanding the eminence of the authority, I am inclined to take issue with Professor Flower upon the etiology of this case. I would not assert that the lack of attrition was not a factor in the result, but I cannot believe that alone it is sufficient to account for the aberration, for the following reasons:

"*First.* It is not absolutely certain that the procession of the teeth in Elephas is entirely due to their wear. Certainly that has something to do with it; but if the animal was entirely fed on food that produced no abrasion of their surfaces, it seems to me there can be no doubt that they would be shed. Probably the time might be deferred, but the posterior molars would certainly develop, and to do this the anterior ones must be removed. We know that in the human subject the deciduous teeth are removed with the development of their successors, and that when there are no permanent germs the first ones are usually retained. This would indicate that the absorption of the deciduous roots is due to the development of their successors.

"*Second.* With the wearing away of the crowns there is a development of the roots of the worn teeth in elephants, so that their removal does not depend upon mere attrition,—that, indeed, inducing exactly the contrary tendency. They are absorbed, as are the deciduous teeth in other mammals. It is a part of the mysterious process of nature, influenced by the pressure of the succeeding tooth. That in elephants the eruption and advance is horizontal instead of vertical does not necessarily change the conditions. Lateral pressure is as effective in inducing resorption as is vertical.

"*Third.* I cannot conceive that the lack of wear of the teeth should affect the structure of their successors. Their form might possibly be changed, as the result of undue pressure upon the formative plates; but this would naturally result in their being crowded together, whereas in the teeth of 'Jumbo' the plates are separated by an undue amount of cementum.

"*Fourth.* The relative proportion of the different tissues is completely changed, thus showing that the development within the crypt of the jaw in the early stages was interfered with. Even though the preceding tooth was not advanced it would not induce this aberration, because the anterior plates are formed before the normal time for the advance of its predecessors has arrived.

"*Fifth.* The fourth molars, in the case of 'Jumbo,' seem to have been considerably worn. The fifth molars are occupying a place anterior to that which belongs to them. They have, it seems to me, unduly advanced. The general appearance is that of teeth that have irregularly developed. It is quite impossible to determine the structure of the posterior plates without making a section of the jaw, as they are yet enveloped in the bone.

"*Sixth.* It is difficult to conceive of food that would cause greater attrition than that which is usually supplied to elephants in captivity. In their native condition they subsist largely upon succulent grasses and shrubs, which in their green state are easily masticated. In captivity elephants are mainly fed upon dry hay, than which few foods could wear the teeth faster, and desiccated grains, the siliceous covering of which must cause great wasting of the tissues of the teeth. It would appear, then, that the amount of attrition in the teeth of a captive elephant should be much greater than in those of one which lives in a state of nature.

"In view of these facts, it does not seem to me reasonable to suppose that this abnormity could be caused by lack of gravel in the food of 'Jumbo.' I should rather attribute it to some injury which he had sustained, and which interfered with the development of the tooth-plates. It might be sufficient to accomplish that without being externally visible. The reversed convexity of the teeth, the change in their morphology, the abnormal development of the alveolus, the malarrangement of the tissues, the distortion in the tooth-plate, all seem to point to this as the predisposing cause. It is possible that the jaw itself is but partially developed. It seems short for an animal of such extraordinary size.

"Nothing but an examination of the forming plates, and of the germs of the remaining teeth, will satisfactorily solve this very in-

teresting problem, and it is very much to be hoped that some competent New York comparative dental anatomist will receive the necessary permission, and make a careful study of this unique case."

(To be continued.)

AMERICAN ACADEMY OF DENTAL SCIENCE.

THE regular monthly meeting of the American Academy of Dental Science was held in the Boston Medical Library Association rooms on June 1, 1892, at 7.30 P.M., President Brackett in the chair.

The paper of the evening was read by Henry S. Chase, M.D., of St. Louis, Missouri; subject, "The Law of Heritage in Regard to the Teeth and Jaws."

(For Dr. Chase's paper, see page 877.)

DISCUSSION.

President Brackett.—The paper of Dr. Chase is before you for discussion. It certainly is a suggestive paper, and makes a broad study of a far-reaching law, and is perhaps quite as profitable in its place as one that considers details of daily practice.

Dr. Williams.—Heredity, in my opinion, may be held responsible not only for disproportion between the size of teeth and jaw, but also for strength or weakness of the tooth-substance.

I don't know whether Dr. Chase in his essay strictly meant that "blood did not tell." If he did, I should not agree with him. Heredity of qualities has been almost universally recognized.

Dr. Kinsman.—I have an interesting case, showing the development of teeth as affected by the law of heredity.

My wife and I are both without lateral incisors. I have two children,—a girl six years old, who had a perfect set of deciduous teeth, and is now beginning to erupt her second teeth, and a boy, who is minus the right superior deciduous lateral, his superior jaw being a perfect miniature of his father's. I had expected that in the permanent teeth there would be a lateral missing somewhere, but I did not look for its absence in the deciduous teeth. Of course it cannot be possible that he will have a permanent lateral on that side. In my wife's family I do not find anything missing in either of the parents, but every other child is minus the

laterals. One aunt is minus the laterals, and retained her superior deciduous cuspids until over fifty years of age. Her superior wisdom teeth were not erupted until after fifty years.

I came across a case recently of a young man of about twenty-five who had four laterals, two of them in the centre of the mouth directly back of the permanent centrals, one of the laterals so placed being considerably larger than either of those that were in position. We frequently meet with cases of one extra lateral, but I never before heard of a case showing two.

Dr. Williams.—I received a suggestion from a patient several years ago which, to his mind, seemed to be an explanation of the cause of the lack of the lateral incisors in his son's mouth.

The son was probably twenty-four at the time, and the father asked me if I thought he would ever erupt the laterals. "Probably not; sometimes they are omitted," I said. The gentleman, who had a stock-farm, said that in raising colts the lack of a tooth was thought to be an indication of high breeding. I told him that perhaps that might account for the omission in his son's case.

Dr. Andrews.—Some years ago, Dr. Cutter, of New Orleans, wrote an article in which he spoke of a colony of tailless cats which existed somewhere on the Mississippi River. He attributed their peculiar condition to the fact that a certain cat lost her tail, and henceforth bore tailless kittens.

Dr. Stevens.—In the State of Maine, where tailless cats exist, they attribute their peculiarity to the fact of their being crossed with rabbits.

Dr. Williams.—Contraction of the jaws has been attributed by Dr. O. W. Holmes in part to lack of use, and in part to habits of hasty feeding. On this theory the sturdy Englishman who takes pleasure in chewing his beefsteak is likely to have an ample alveolar arch and a full complement of teeth. But where soft foods are largely used and the teeth are not needed in mastication, there is likely to be a deterioration in the quality of the teeth and lessening of their number.

Dr. Meriam.—Dr. Andrews's statement with regard to tailless cats reminds me of one of the curious things which are said about the breeding of rabbits. By crossing two breeds and breeding the offspring of this union to the offspring of two other distinct breeds, it is possible to obtain a rabbit which will hold a distinct strain. With regard to cats, you may have noticed that the ordinary tortoise-shell cat is always a female, and the buff cat is always a male, and they will hold to these colors, no matter how much they are bred.

Dr. Moffatt.—One of the most important suggestions made to-night is that data should be collected and kept in the museums of our societies, in order to form a basis for arriving at conclusions as to the subject under discussion. We need models of cases and full notes with reference to them.

Dr. Smith.—Irregularities of the deciduous teeth are rare. Dr. Talbot has, in his collection, two or three cases of supernumerary teeth in the deciduous set. I have, in my own collection, a case showing a supernumerary deciduous lateral. I have never read of or seen a case where the deciduous lateral was missing. It seems to be established that irregularities of the teeth are produced by a crossing of types and races. It is stated that in a pure race like the Chinese, Japanese, or North American Indian there are no irregularities. Such deformities are therefore in a sense the result of civilization.

Dr. Meriam.—I have in my care a little patient presenting a clear case of protrusion of the lower jaw. It is an irregularity of the deciduous teeth, and I have never seen such a case before. With regard to the matter of heredity, I can call to mind instances where the union of healthy parents has produced feeble offspring. We cannot quite say that the bringing together of certain people will furnish a definite result.

President Brackett.—There is much lack of definite views on the subject of heredity. To my mind marked peculiarities are attained through a peculiar heredity and its cultivation. Given a certain line of ancestry, and peculiar characteristics can be developed. The confusion appears in many men's minds that surgical procedures are a matter of considerable consequence. To me they seem of little importance, except as they affect the use of a part. In the State of New Hampshire the farmers have, for many generations, cut off the tails of lambs, but as far as I know there have been no lambs born without tails.

The Jewish custom of circumcision is another case in point. The extraction of teeth has little, if any, influence upon the number of teeth to appear in succeeding generations. But when teeth are lacking through nature's operations, and people having such peculiarities intermarry, then a lack of teeth may be expected in their offspring.

PRESENTATION OF SPECIMENS.

President Brackett.—A gentleman, aged about thirty-five, came to me two months ago with these little specimens which I pass around.

They have all the characteristics of calculus. The patient for about two years had been having trouble in the region of the left lower third molar, which tooth had never erupted. On examination several fistulæ were found on the inside of the mouth. There was considerable swelling and a profuse and offensive discharge. After injecting a solution of cocaine and carbolic acid I cut through the soft swollen tissues. A probe disclosed something feeling like a tooth. With this lever-like instrument I was able, without much difficulty, to bring to light this third molar. The crown of the tooth was incrusted with calculus, and hence the origin of the particles first passed around. After the operation, the affected parts returned to a healthy condition in reasonable time.

Dr. Andrews.—Dr. Charles H. Osgood, of this city, had a patient several years ago, who was frequently confined to his bed for two or three weeks on account of pain about the face. The best surgeons of Baltimore and Boston had failed to locate the cause of the trouble. Dr. Osgood suspected an unerupted wisdom tooth, and finally succeeded in extracting one which looked very much like the one which Dr. Brackett has shown to-night.

Dr. Stevens.—That brings to my mind the case of a young lady who was a patient of Dr. Charles Aspinwall, of Lynn, Mass. She had a sore on her face for which she had been treated by surgeons in vain for a long time. Dr. Aspinwall removed from her a wisdom tooth, extracting it from the outside through the cheek.

WILLIAM H. POTTER, D.M.D.,
Editor American Academy of Dental Science.

ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.

THE regular meeting was held October 8, 1892, at the rooms of the Society, 1228 Walnut Street, Philadelphia, President Louis Jack, presiding. After the transaction of the usual routine business, a paper by Dr. W. G. A. Bonwill, of Philadelphia, was read on the following subject: "Mechanics in Dentistry.—Is Dentistry a Science or a Profession?"

(For Dr. Bonwill's paper, see page 860.)

The President called upon Dr. Truman to open the discussion.

Dr. Truman.—There is not much to discuss in the paper, as I view it. I think we can agree with Dr. Bonwill that we are all mechanics in one sense, but because we are so it does not follow

that we are not professional men. We can combine the two. I do not regard it possible to practise dentistry without being scientific, —without being something more than a mere worker in tools. A single tooth in the mouth cannot be treated without understanding the very science derided here to-night, and the moment the operator steps aside from that, just at that moment he is a failure in dentistry. To me the argument made is simply a plea for a special line of work.

We belong, I believe, to a growing profession, and I hope to see it develop into one of the great professions of the world. I believe we have in this work very much that is truly scientific,—more involved in it that is good for humanity than almost any other. Medicine is not science; never has claimed to be. There are specialties in medicine that are truly so, and ours is one of them. I contend that we, as dentists, have just as much right to the title doctor as any man in medicine. I am unwilling to lower my flag to any medical man, no matter how skilful he may be.

To practise our profession, we must be mechanics, and I am proud of it. I can never look at one of the great buildings in this city without veneration for the man that has reared it. Standing under the dome of St. Paul's, London, I could feel the power of the individual that laid one stone upon another, but because I thus feel is it required of me that I should abandon the position gained by greater effort? I object to it.

It is no wonder Dr. Bonwill did not value his degree; he never earned it. If he had gone through the schools day after day, sitting on the hard benches, and had studied along with others, he would have appreciated the feeling all have as students and as co-laborers. He came into the profession through another door, and there I leave him.

Dr. Leffman.—I do not know that I can add anything to the discussion. I feel very much as Dr. Truman does, that there are two sides to the profession, which certainly is regarded generally as a mechanical one.

I do not agree with the inferential condemnation of purely scientific students, which I gather from the paper. I believe the advances made in bacteriology have been of great value, although it may not at the present moment appear quite so clearly to everybody, particularly with practical men, who have learned to deal with problems in the operating-room. I think it is of great value in modifying the methods of dentists.

When the bacteriological discoveries were announced years ago

they were smiled at by many, but are now acknowledged to be of value. Even the late development and discovery of lymph, as it was called, after passing through a period of contempt and condemnation, is now coming to be recognized as a most valuable aid in the treatment of a most formidable affection. The work of research in our practice is not as brilliant in its results as some other departments, by reason of the narrowness of the field, but it will certainly have its effect. I have myself, as a teacher in a dental college, been interested for years in everything connected with its advancement, and I therefore cannot deny that a large part of dentistry is mechanical, as it is also a part of surgery. The most brilliant work of surgery is of that character, but we must not overlook the purely professional feature.

I am inclined, therefore, simply to second Dr. Truman's remarks that the dentist is entitled to the degree of doctor, and by encouraging the development of the dental student, and giving him something of a professional standard to attain, we develop his usefulness and make him far more serviceable in the practice of his profession.

We may leave the purely mechanical features to their natural development. The human mind, especially the American, runs largely in that direction. I do not think we will have any want of improvement in this by reason of any development of theoretical or professional features.

Dr. Jeffries.—It seems so me that the key-note has hardly been struck, or, at least, I haven't heard anybody take the position I think the question should occupy. Dentistry, as practised at the present day, is something that stands entirely by itself. It is professional; it is mechanical; it is artistic. You cannot practise successfully without bringing all into use. An exponent of the art in the highest degree must have attributes which every man cannot possess. He must be thoroughly learned in manipulative skill, which he can only acquire by proper teaching in his college and in his office; if he has cases to regulate, it will require the highest degree of mechanical skill, and it does seem to me that to call it either the one or the other is a mistake, as it will need both to make it a success.

Dr. Darby.—I think Dr. Bonwill was pleading to-night for only one side of the question. I do not think that away down in his heart he repudiates the theoretical part of dentistry. He was talking on only one side of it. We all know that it is out of the abundance of the heart the mouth speaketh. He is a mechanical inventive genius, and it is natural he should dwell in that direction,

but I do not think he repudiates the idea of the value of therapeutics or bacteriology in the management of dental lesions or in the treatment of teeth. I should be very sorry to think he was so biased in one particular direction, or that he had so little sense, if I may say so, as to wish to bring that paper as an epitome of the intelligence of the profession. It certainly is not.

Dr. Guilford.—I doubt if Dr. Bonwill expressed himself as clearly as he might have done. When making his special plea for mechanics he seemed to think it was something separate from science, which is a great mistake.

Dr. Bonwill is well acquainted with mechanics, especially dental mechanics, but he never did a single thing, he never invented any instrument, without there being science at the bottom of it. I don't see how the two can be divorced. They belong together. There is not a motion in mechanics but has associated with it the elements of science; so that when we consider the dental profession, I think the majority of us would not be willing to agree to what Dr. Leffman has said, that it is a specialty of medicine, and we are rather inclined to call it a branch of the healing art.

There are certain things connected with the practice of dentistry which make it different from any other profession or calling. We treat cases as medical men to a limited degree. We are mechanics in filling teeth or making a plate. If we do our work in an artistic and skilful manner, if we perform all the different things we are called upon to do, I cannot see why we are not scientific and artistic, because both of them are really connected in mechanics; so that I should say that the professional dentist includes not only mechanics and art, but science also. Some of the work is very difficult,—more so than much of that done by some of our sister professions. The surgeon's amputation of a limb or removing a bone requires a certain amount of manipulative skill and scientific knowledge, or it could not be done successfully, and yet we have surgical work that is more difficult than the removal of a bone, setting a limb, or amputation.

Take, for instance, the branch of orthodontia where the positions of the teeth require changing. It seems to me that this includes all the different elements we have been speaking of to-night. Appliances must be made to move the teeth. The lines of force must be exactly known, and also the power of resistance and the correlation of forces. Is not all that scientific? Does not that introduce mathematics in a very large degree. And when a tooth is to be moved, it cannot be performed as a surgeon would, by a simple

surgical operation. It must be accomplished in a very slow manner indeed. Forces must be applied, and certain changes must be depended upon which will enable the tooth to move. It has to be performed with skill, care, and caution. After that we are obliged to retain the teeth in place. So I believe there is more difficult surgery involved in the correction of a case of irregularity than in the amputation of a limb.

Dentistry occupies a very large field and brings in different sciences and arts, and if this be true I think we occupy a position by ourselves. Anything that is made up of science and art is a profession, and it is nothing else.

I agree entirely with Dr. Bonwill's plea for mechanics, but I think he has not made it broad enough, because it includes a great deal more than that. He spoke, too, of the fact that students were not willing to take up the mechanical part. That is certainly true to a large extent, and I think that difficulty has been recognized by the teachers of to-day, and arrangements have been made by which they shall be taught this branch more fully than they have been before. I know it is so in many colleges; it may be so in all. As soon as a want or a deficiency of that kind is felt, arrangements are immediately made to remedy it, to turn out, if possible, better and more scientific and skilful dentists than have ever been graduated in the past.

Dr. Bonwill.—In answer to criticisms and remarks made by the members, I have to correct the very false idea raised by most of them that I could not see that dentistry could be more than mechanical. While I can count upon my fingers the number of my medicinal remedies, I am not lost to the fact that a man should be well educated and have passed through a medical training, not alone for the remedies used, but for the higher culture it gives to one, and for the better understanding the laws of inflammation and the aseptic treatment. The remedies are very few that are actually needed for any and all the diseases of the teeth and adjacent parts, yet they should be intelligently understood to be made effective.

What I mean is, that above all else we must admit that mechanics in dentistry is the basis of nearly all our needs and successes, and that when we would sink this principle out of sight, fearing to face the world with such a name, we are doing that which is unworthy of our calling.

Much stress has been laid on the treatment of caries by asepsis, as if it were the *sine qua non.* Professor Tait, of Scotland, demon-

strated that he had greater success with cleanliness than by the medicines for aseptic treatment, and Professor Lister had to acknowledge at Berlin, in 1890, to the mistake he had made in attributing so much to carbolic acid and antiseptics.

I would not for a moment have you simply be a mechanic in dentistry. In dealing with the human economy we must have as much information from study as will enable us to put our mechanical skill to the proper use; law cannot be successful unless a man has ingenuity or power of construction.

Invention gives in this line of work a power not attained outside. We cannot deny that should we lose our hands we would be helpless. Manipulation is mechanical dexterity, and let us call it by the right name,—not *prosthesis.*

HARVARD ODONTOLOGICAL SOCIETY.

A REGULAR monthly meeting of the Harvard Odontological Society was held on Thursday evening, September 29, 1892, at Young's Hotel, Boston, Dr. Werner being in the chair.

The paper for the evening was read by Edwin C. Blaisdell, D.M.D., of Portsmouth, N. H.; subject, "Operative Failures and their Remedies."

For Dr. Blaisdell's paper, see page 868.

DISCUSSION.

Dr. Smith.—Mr. President and gentlemen: I am particularly pleased to-night to hear this paper, because it became my duty not long ago, as one of the members of the Faculty, to consider the fitness of certain men as instructors in the Dental School of Harvard University, and it was my pleasure to consider the name of Dr. Blaisdell, and to favor his appointment; and after hearing his paper this evening I am very glad that I did, and feel that the school has been benefited by his selection as one of the instructors.

Following the line of his arguments, I can simply say that in the main I agree with and endorse what he has said on the points mentioned. I know it is claimed by some that gutta-percha at the cervical wall in approximal cavities is not at all necessary; that a cement properly mixed and properly placed in the cavity would stand equally well at the cervical margin as gutta-percha. That has not been my experience, even when I have used the matrix; and

so, notwithstanding the fact that this opinion seems to be held by some competent men, I consider that for the general practitioner it is always much safer to use gutta-percha.

The essayist spoke of the danger arising from the use of gutta-percha fillings in crowns with frail walls. I have never used gutta-percha as a crown filling, but I have seen the same result that he speaks of,—the enamel being fractured, and, as he says, in such places that it was very evident that the fracture was caused by the expansion of the gutta-percha without the aid of masticating power.

Referring to the use of copper amalgam, I have never had any experience in it at all, as I have never used it. We heard a great deal about it at one time, and Dr. Rollins, who experimented with it, was quite enthusiastic and wrote some papers recommending its use; but he has since taken it all back, so I consider that I have not lost anything in waiting for somebody else to experiment and find out whether it was of value or not.

The question as to whether we should use amalgam as a filling, is one which I should like to have settled scientifically. There are many cases where we put in amalgam fillings, and they seem to be doing good service until some day the patient becomes ill, and the physician proclaims that you are poisoning the patient; for that reason we have to be careful in its use, and I shall be glad when the time comes that we have a scientific solution of the matter, and have it definitely settled one way or the other.

The use of gold and amalgam in combination is a method of filling that I have employed for some time, and have fillings that have been in a great many years which are still in excellent condition, and I have never yet seen cause for regret in its use. I don't remember when I first began to use it, but I was led to it first by patching gold fillings with amalgam. We often see a beautiful gold filling extending from the cervical wall and including part of the crown; that filling has given out at the cervical wall. It may be one of our own, or it may be the work of an operator who has the reputation of being very skilful; and when it is, we are rather apt to be glad than otherwise, for we know so well that ours fail in the same way in spite of all our care; we have patched those fillings with amalgam and found that they have preserved the teeth. In this way I began many years ago to use amalgam in the commencement of this kind of fillings, and then at the next sitting introducing gold; but I think it is to Dr. Clapp that we owe the combination filling at one sitting. I cannot say that he invented it,

but he has certainly impressed it upon our minds, and Dr. Clapp's name will be associated with that method of filling because of his efforts to promote its general adoption.

The method of shoeing teeth is a good one. I have never used it in a live tooth, but I have practically with pulpless teeth, having the pin go into the root in a similar way. Long ago, when a student with my preceptor, Dr. Shaw, a number of teeth were shod by him in that way. We often read of something supposed to be new which we practised several years before. In looking over some old teeth recently I found some shod in this way; but it is an excellent way of treating teeth, nevertheless.

It struck me when I read the subject, "Operative Failures and their Remedies," that some were not due to the lack of skill or to the lack of method, but in many cases to a lack of time,—we are apt to operate too hurriedly. Many dentists charge too small a fee; their business increases, and it is money in pocket to see as many patients in a day as possible. When that time comes, that moment their skill as an operator declines. There are a great many young dentists who have failed as operators because they have tried to see too many patients. Now, gentlemen, every Harvard graduate—at least all that I know anything about—is skilful enough to charge more than the average fee for the service rendered, and it behooves us all for our health and for our reputation to bear this fact in mind. Take time enough to do your work thoroughly, charge a respectable and just fee, and one great cause of operative failures will be removed.

Dr. Cooke.—I have seen some cases where copper amalgam has been very successful, and has preserved the teeth where nothing else under the circumstances would; but I have seen a great many more cases, especially in approximal fillings, where it has dissolved exactly as an oxyphosphate filling does; for that reason, and for others given in my paper last spring, I have used this material but a very little during the past year, and then only where I felt obliged to, in repairing fillings.

While this method of shoeing teeth would be very good in some cases, a great many teeth are not strong enough at the edges for such treatment. Two holes in that situation would certainly weaken it, especially if it had an approximal cavity.

I agree with what Dr. Smith has said about hasty operations which result from the dentist charging too small a fee and being too busy. It is not a question in dentistry of what a man can do, but of what he does do,—it depends not so much on his ability, as

upon his conscience. Many men can do good work, but become careless, excavate only slightly, and the patient finds subsequently that the work was not properly done. I am firmly convinced that the decaying material should all be cut out. We have repeatedly seen decay left in cavities and covered with gold; in such cases you know the cavity has not been properly excavated.

Dr. Page.—I am very much encouraged by what Dr. Smith said about charging respectable fees and operating for fewer patients. I do not believe in working so many hours a day as some do, but I do believe in using natural forces and saving our own energy, which will assist you to find time to overcome more failures.

Dr. Upham.—I want to speak, in this connection, about the cavities at the cervical wall in bicuspids and molars, and, in fact, all teeth excavated with a convex instrument like a spoon excavator, which leaves a sharp edge or acute angle at that point instead of an obtuse angle or bevelled edge. Some instrument should be used which makes a bevelled edge, leaving an obtuse angle at least upon the enamel rods, when the cavity is finished. I will show some instruments that I use for that purpose. They explain themselves. The failure of many approximal fillings is due to improper excavation here, instead of using wrong materials. A spoon excavator in approximal cavities where teeth are very close together cannot be used on the margin of the cavity so as to give even a right angle. There will be a convex cut there, leaving a sharp or acute-angle edge. There should always be at the cervical wall a bevelled edge,—the enamel bevelled surely, to avoid fracture in condensing gold.

Dr. Grant.—What Dr. Blaisdell says about oxyphosphate fillings I endorse most thoroughly, and although it is the universal practice among men who try to get the best results in such fillings to use gutta-percha, I think in many instances gutta-percha is very poor material to use. If the tooth is sensitive, it will not bear the pressure of a filling at the cervical wall. I don't know just what to use. Of course, I feel certain that the cement will dissolve, but I do it because I can't do better. In some instances I have used amalgam and put oxyphosphate over it, and it is generally far enough under the gum to be so that it is beyond the reach of thermal changes, and works very well. At other times I simply use oxyphosphate and expect it to dissolve.

I do not have the very best success always in working with a matrix. I often find teeth very small at the neck and large at the grinding surface, and it is laborious to cut down the surface made

under the matrix, which is almost a perpendicular line; of late I have been using a hand instrument. It is simply filed down thin as a steel matrix, and, holding that in one hand, I can fill with gutta-percha, or even with amalgam, and contour the tooth, and do not have so much to do at the close.

I have used the gold and amalgam as Dr. Smith described, which is to fill partly up with amalgam and allow it to set, and at the next sitting introduce the gold. It is a good way of making large fillings,—far better than making them all of gold.

I am an advocate of soft gold at the cervical margin. I do not believe that cohesive fillings are adapted there. I should never feel, when putting one in, that it was permanent.

Dr. Perrin.—The matrix has been spoken of, and I am sure I have less failures when I use it. I have tried to fill cavities at the cervical walls without it, and find I can work them much better with it. At the cervical margin of proximal cavities in bicuspids and molars I consider a matrix indispensable.

Dr. Blaisdell.—I would like to ask Dr. Perrin if he holds his matrix in place rigidly, or loosely, in order to get that little bulge?

Dr. Perrin.—I like to have them fit closely. I use a matrix that is applied very easily; I believe the name of it is the Ladmore-Brunton. I always use the crystal gold, or Steurer's gold, to start my filling, and pack against the matrix.

Dr. Hopkins.—I never saw a matrix that would not bulge in packing the gold sufficiently to contour.

Dr. Shepherd.—Excluding moisture is very important. I use the rubber dam a great deal more now than formerly. We often try to fill small, inaccessible cavities hurriedly, using a napkin and putting in amalgam; and as we do not want the amalgam to set, are apt to be careless about having the cavity perfectly dry, and secondary decay is almost sure to follow.

As far as undercuts go, I think the smaller the undercut the better. In many cases I make no undercut. I merely have the inside of the cavity a little larger than the outside, and get rid of the angles in that way.

HENRY L. UPHAM, D.M.D.,
Editor Harvard Odontological Society.

Editorial.

DENTITION: A REPLY TO MEDICAL CRITICISM.

This subject seems to have started anew with our brethren of the medical profession, judging by the two articles which we publish in this number, one original and the other under the head of "Selections."

It is passing strange to the dental mind that the medical profession should at this late day be gravely discussing the question whether "dentition produces general or reflex symptoms." It seems to prove that, with all the intelligence manifested in other directions, the relations the teeth maintain to the rest of the organism has yet to be comprehended.

While it is true that all diseases of infancy, and we may say childhood, cannot be ascribed to dentition, there are certain well-marked conditions, unmistakable to the trained intelligence, produced by reflex disturbance, and we fail to understand why these are not recognized.

It is difficult to believe that our medical friends are not familiar with the anatomical features surrounding the developing tooth and fail to recognize the possibilities connected therewith, yet a careful reading of the two articles named leads directly to such a conclusion.

It certainly must be conceded that teeth are not developed at once, but by slow and very gradual processes. If these be continued with an harmonious growth of contiguous and related parts, dentition may proceed in the deciduous series with but slight reflex disturbance; but, if this be not the case, growth means pressure on the nerves supplying the pulp, followed by irritation to be felt possibly throughout the organism, producing new centres of irritation and new foci of inflammation.

A very remarkable statement is that of the editor of the *Journal of the American Medical Association*, that "we think it can be said, without fear of contradiction, that there is not a single positive observation which has ever been recorded to prove that dentition produces general or reflex symptoms. It is undeniable that at the period in life when dentition is in progress the infant is subject to

certain disorders which occur much more commonly than at any other period of life."

Again, Dr. Patterson reiterates this idea in his paper when he quotes from the editor of the *Dental Cosmos:* "What proof have we that otalgia, otorrhœa, deafness, amaurosis, hemicrania, neuralgia, hysteria, chorea, epilepsy, tetanus are produced by dentition?" And then adds, "The hurricane of progressive medicine has swept away such wild and speculative theories."

It would seem a waste of energy to quote to men who must be already familiar with the literature of the subject, but if they wish to know of cases of reflex disturbance minutely described, we can refer them to Dr. Georg Creniceanu (appendix to "Diagnostik der Zahnkrankheiten," Arkövy), in his valuable paper on diseases of the eye produced by pathological conditions of the teeth. These are given in detail, and should at least cause serious reflection.

Coming nearer home, and more readily procurable, they will find the entire subject considered with marked ability by Dr. Albert P. Brubaker, in his exhaustive paper in the third volume of the "American System of Dentistry." We would ask their attention to the following quotation: "It is a reasonable supposition that the laws of nerve-force correspond to the same general laws as other forces. As no force is ever lost, but must, when it disappears, appear as some other mode of motion, so peripheral irritation—continually travelling inward—is either reflected over and outward by other routes to other organs, or is stored up in interrelated centres until morbid function results in them."

It may be objected that the statements made are mainly confined to diseases of the permanent teeth, but the law of force applicable in the one case must be general in its operation, or it ceases to be a law. We have not the space to quote in full from authorities on this subject, nor is it necessary; but the following from the pen of Dr. James W. White—in the "American System of Dentistry"—clearly expresses the idea that greater possibilities of reflex disturbance are usual in infancy than in maturer years, a conclusion borne out by the observation of the writer: "Owing to the predominance of the spinal system in infancy, this sympathy of distant organs with one another is notably greater than in adult life, creating a special tendency to the production of reflex phenomena. The exceeding mobility of the nervous system at this period is also such that a mere peripheral irritation is liable to result in sympathetic general disturbance,—often, indeed, to the overshadowing of the original lesion by accessory phenomena."

It is certainly too late in the progress of medical science to assert that no reflex disturbance occurs in teething, or that it is solely dependent upon the eruption through the gum-tissue. Such a statement seems to indicate a blind perversion of facts, and which could never be made truthfully by one who had watched the progressive phenomena resulting from dentition and the relief afforded by the use of the lance. Condie ("Diseases of Children") relates the following case, which, while an extreme one, could be duplicated in degree in the experience of many: "A child, after having suffered greatly from difficult dentition, apparently died and was laid out for interment. M. Lemonnier, having some business at the house of the nurse with whom the child resided, after fulfilling the object of the visit was desirous of ascertaining the condition of the alveola. He accordingly made a free incision through the gums, but on preparing to pursue further his examination he perceived the child to open its eyes and give other indications of life. He immediately called for assistance, the shroud was removed from the body, and by carefnl and persevering attention the child's life was saved. The teeth in due time made their appearance."

No consideration of dentition would be complete that failed to estimate the possibilities of reflex disturbance in the eruption of the permanent series, together with the reasons that cause special phenomena. The writer of "The Dental Aspect of It," in this number, may have reason for his opinions in experiences with teeth of English patients, not attainable in this country with our mixed population. The type of teeth may be nearly or quite established in Great Britain, which gives the greatest harmony of development and the least liability to reflex irritation. That perfection has not been reached on this continent, and the death-rate will continue to extend indefinitely until that desirable end is accomplished.

The teeth anterior to the second permanent molar rarely give recognizable systemic disturbance as they develop gumward. The first permanent molar being developed in the body of the inferior maxilla, where ample room ordinarily exists, is erupted without special notice, but this happy condition of affairs cannot as a rule take place with the second molar in the same jaw. We speak of the inferior maxilla, as it is here that in our opinion most, if not all, the reflex phenomena originate.

Why should the second permanent molar produce unusual irritation and be a source of disturbance to a greater extent than the first? The answer will be found in the fact that these teeth are developed in the rami of the jaw, and in assuming the direct vertical position

the space at the angle is frequently not sufficient to allow for their development. The process of formation of the dental tissues proceeds regardless of this, and the result is pressure upon the inferior dental nerve and possible cerebral disturbance to an alarming extent. As this stage antedates by several years the proper time for eruption, the question of the gum having a part in the lesion need not be considered. The writer of this has had occasion to relieve convulsions, unquestionably arising from this tooth, at least four years prior to its final eruption. The proof that it originated here was furnished by the fact that lancing would relieve the seizure, and when the case was carefully watched in anticipation, lancing would invariably prevent it. If our correspondent will carefully examine a child's skull about the age of nine years, he will, we think, come to the conclusion that the possibilities of irritation are not remote.

The reflex disturbances of the third molar are so well known that it seems useless to more than mention them. A case of a misplaced wisdom tooth which came under the care of the writer was the cause of not only untold suffering through eighteen years, but resulted in great loss of vision, and deafness. Both the eye and ear assumed nearly their normal functions on the removal of the cause. It must have come to the notice of every aurist, as it certainly has to every dentist, that the so-called earache of childhood is often the result of an exposed pulp, and the relief given the latter cures the former. The neuroses dependent on various pathological conditions of the teeth are so well understood that no further mention need be made of them.

The perforation of the gum has been regarded by almost all medical writers as the primal cause of all the phenomena attendant upon dentition. That this is an error is clearly manifest to every observant dentist. The gum is by no means a very sensitive portion of the organism, and, were it not for the causes enumerated, there would be but little trouble attending the process. The part the gum takes in this is to hold down the entire body of the developing tooth, producing the pressure before mentioned, the exception being the second molar. If resorption of this tissue proceeds in proportion to development, there is no untoward result, but if not, then means must be resorted to to relieve the tension. To wait until this is manifested by the upward extension of the gum is simply to fail to understand conditions, for, as Dewees says ("Treatise on the Physical and Medical Treatment of Children"), "Though the tooth cut upon may be yet remote from the surface,

the operation (lancing) may be of the greatest possible advantage."

The statement of Dr. Patterson that "this pathological condition (inflammation) has its origin in micro-organisms has yet to be proven; and that they have anything to do with the systemic disturbance of dentition, except as a secondary factor in the increase of inflammation in near or remote parts, is not established. The whole theory of inflammation remains to-day very much as it was left ten years ago, notwithstanding the advances made in bacteriological research. The theory that bacteria are the cause of lesions in dentition has no support to sustain it, unless the phagedenic condition of the gums covering the erupting teeth be regarded as an illustration. This, however, is a very exceptional condition, resulting from causes existing in the oral cavity, and entirely independent of dentition as we understand it. Where ulceration is present it means simply local inflammation without systemic disturbance, unless it extends to the pericementum, as is frequently the case in the wisdom teeth.

The assertion that micro-organisms can "affect the tissue in question through the circulation" is not fully supported; indeed, is at variance with the investigations of some of the best minds in the medical profession. Attention is called to the report of M. Peyrot, at the Fifth Surgical Congress, in Paris, 1891; also to the sterility of pus in abscess of the liver, by Kartoulis and Lavaran; to the investigations of Janowski in regard to creolin; to the results obtained by G. Lemaire in injections of mercury, and finally to the conclusions arrived at by Kreibohm, Rosenbach, Grawitz, and de Bary, quoted by Miller. The question still remains an open one, and dogmatic assertions are, as yet, out of place.

We would recommend our medical friends to make a thorough re-examination of this important subject, satisfied that if this be done new light will dawn upon many pathological problems as yet obscure to their minds.

THE CLOSE OF THE VOLUME.

With the present number, Volume XIII. of the International Dental Journal will have completed the record for the year. Whether this marks an advance over those that have preceded it our readers are fully able to determine. It has been a year of continuous work, but it has had its compensation in that the effort

has been in the direction of a higher standard of dental thought and practice. How far this may have reached, or to how many minds it may have been an incentive to better things, who may tell? It is not the prerogative of any editor to analyze his work. He can have little to do with results, but the motive that actuated thought is his own, and the mental compass, properly directed, will point unerringly in a true direction, and, this followed, will end in a safe harbor.

Exactly what constitutes the best-conducted journal has not yet been decided, and probably never can be to the satisfaction of all minds. The tastes of individuals are too various to ever harmonize. The editor, therefore, who aims to please all will end just where he ought to, in satisfying none. In all probability many have been displeased with certain portions of the work. We should be dissatisfied were it otherwise, as it would indicate that the duty intrusted to us had not been properly performed.

Progress can only be assured in any line of labor through friction. The man who never makes an enemy never can rise above the dead level of insipid thought, and the editor who proposes to live in harmony with all mankind is unfitted for his calling.

Without any appearance of egotism, we think the INTERNATIONAL DENTAL JOURNAL has, month by month, furnished a most satisfactory exhibit of the higher mental and scientific work of the profession. We can point to this as proving that there has been a continued and healthy advance in intellectual force. Progress is made so slowly that it frequently appears as though no advance was being made, and it is only by comparison with past periods that just conclusions can be attained.

To those who have assisted the JOURNAL by their valuable contributions we are deeply indebted. Without their aid it would have been forced to cease the work devolving upon it to perform. To those who have failed to recognize the importance of independent journalism we have this to say,—no great work has ever been performed in the world by men who lacked positive convictions, or who preferred expediency to principle.

The progress of the JOURNAL the past year has been entirely satisfactory to the management. That this has been accomplished in the face of indifference and, at times, open antagonism, is certainly gratifying. As the only journal now published by dentists, and free from cliques and entangling alliances, it occupies the truest position to advance the best interests of those it aims to represent.

The changes the past year have not been many; indeed, so little has the surface of the professional waters been disturbed, that the ordinary observer would be inclined to believe that nothing had been gained, but this would be far from the truth.

The work, good or bad, is in the past. We have no promises to make for the future. The main desire will be to meet all demands, make the JOURNAL worthy of its readers, and, as new occasions arise, learn to advance with them to a still higher conception of the possibilities of professional life and professional principles.

Current News.

THE WORLD'S COLUMBIAN DENTAL CONGRESS, TO BE HELD IN CHICAGO, AUGUST 17 TO 27, INCLUSIVE, 1893.

[THE following abstract is taken from the general circular of the Finance Committee of the World's Dental Congress.—ED.]

"It has been voted that the membership-fee shall be ten dollars. To be collected only from residents of the United States.

"It has been voted 'that the membership shall consist of legally qualified and reputable dentists (as defined in the Code of Ethics of the American and Southern Dental Associations) residing in the United States, and all foreign dentists regularly qualified by the laws of the countries from which they come, and such other scientific persons as may be invited by the Committee on Invitations' (Committee No. 11).

"It will be seen that the doors are open to every reputable dentist in the United States. All will be welcome except those who are illegal practitioners in States having laws, or who are violators of the Code of Ethics. Should any such join, or attempt to join, and it is known, the name of such applicant will be referred to the Membership Committee. It is advised that no subscription involving any right of membership be received by the State Finance Committees from such as are known to be ineligible to membership.

"The General Finance Committee submitted to the Executive Committee the following plan, and it was unanimously voted that such plan should constitute the 'rule of action':

"*Resolved*, That the General Finance Committee be authorized to guarantee to contributors who would be eligible to membership as follows:

"*First.* That every contributor of ten (10) dollars shall receive the Transactions if he does not attend, but will be expected to pay the membership-fee of ten (10) dollars in addition, should he attend the Congress.

"*Second.* That every contributor of twenty (20) dollars shall receive the Transactions of the Congress if he does not attend, and if he attends and joins the Congress, his receipt for contribution shall be accepted by the Treasurer as full payment of the membership-fee of ten (10) dollars.

"*Third.* That every contributor of thirty (30) dollars or upward shall have all the advantages of the contributor of twenty (20) dollars, and in addition shall receive free the Commemorative Medal which will be struck.

"From the foregoing it will be seen that the solicitor for contributions can assure each contributor of ten dollars or upward that he will receive a substantial return, whether he attends or not.

"To accomplish all this work will demand a large amount of money. The items of stationery, printing, and postage will call for considerable ready cash, which must be advanced by those doing the work, in addition to their generous and gratuitous labor, or be furnished by the prompt, liberal, and patriotic contributions of the dentists of the whole country. Careful estimates place the amount to be contributed in advance of the Congress at thirty thousand dollars.

"It is judged by all who are conversant with the work done up to the present time that this Congress will mark an epoch in dental progress, and be the largest in numbers and most valuable in results of any dental meeting ever held.

"The General Executive Committee feels that a great trust has been committed to it, which it will endeavor to manage in a broad and liberal spirit.

"The General Finance Committee has perfect confidence that the profession will respond promptly and generously to its call for contributions to insure the success of the Congress and the honor of American dentistry.

"The receipt which the Treasurer, Dr. J. S. Marshall, will mail to each contributor will have printed on it the conditions before mentioned as part of the contract between the Congress and each contributor."

RECENT PATENTS.

A LIST of recent patents, reported specially for the INTERNATIONAL DENTAL JOURNAL:

481,740.—Dental Burring Tool. R. G. Stambrough, New York, N. Y. Filed January 20, 1892.

482,520.—Portable Dental Chair. F. H. Field, New Orleans, La. Filed June 20, 1891.

482,558.—Dental Drill. Louis Maillard, Galt, Canada. Filed March 31, 1892.

482,552.—Dental-Tool Sterilizer. W. G. Flanders, New York, N. Y. Filed February 9, 1892.

483,807.—Dentist's Chair. William A. Johnston and Arthur W. Browne, Prince's Bay, N. Y., assignors to the S. S. White Dental Manufacturing Company, Philadelphia, Pa. Filed October 31, 1889.

484,287.—Dental Instrument. John C. Blair, Louisville, Ky. Filed March 2, 1892.

484,747.—Dental Chair. Levi Stuck, Bad Axe, Mich., assignor to Aaron P. Gould, John C. Skelton, and Albert Hœffer, Canton, Ohio. Filed September 4, 1890.

485,010.—Dental Instrument. Charles W. Jones, St. Paul, Minn. Filed February 4, 1892.

Trade-Marks. 21,882.—Dental Rubber. Excelsior Rubber Works, New York, N. Y. Filed September 13, 1892. Essential feature, the word "Ideal."

AMERICAN DENTAL SOCIETY OF EUROPE.

THE Eighteenth Annual Meeting of the American Dental Society of Europe was held at Basel, August 1, 2, and 3. The following officers were elected:

President, Dr. L. C. Bryan, of Basel; Vice-President, Dr. J. H. Spaulding, of Paris; Treasurer, Dr. Charles J. Monk, of Wiesbaden; Secretary, Dr. Chas. W. Jenkins, of Zürich.

On account of the large number of members who intend to visit Chicago in 1892, the next meeting was appointed for August, 1894, at Geneva.

CHAS. W. JENKINS,
Secretary.

CALIFORNIA STATE BOARD OF DENTAL EXAMINERS.

At the last annual meeting, August 4, of the California State Board of Dental Examiners, twelve applicants were examined, of which two were successful, and the following officers elected: President, J. L. Asay, M.D., San José; Secretary, J. D. Hodgen, D.D.S., San Francisco.

J. D. Hodgen,
Secretary.

CALIFORNIA STATE DENTAL ASSOCIATION.

At the Twenty-third Annual Meeting of the California State Dental Association, held at San Francisco, July 19 to 22, the following officers were elected for the ensuing year: President, W. J. King, San Francisco; First Vice-President, L. A. Teague, San Francisco; Second Vice-President, I. W. Hays, Grass Valley; Third Vice-President, J. P. Parker, Santa Cruz; Recording Secretary, L. Van Arden, San Francisco; Corresponding Secretary, Chas. E. Post, San Francisco; Treasurer, T. N. Iglehart, San Francisco.

Chas. E. Post,
Corresponding Secretary.

Selections.

DENTITION IN INFANTS.

A communication from the pen of H. C. Wood, upholding gum-lancing, and taking issue with the views of Forchheimer on the subject, as detailed in his recent book on the "Diseases of the Mouth," has been copied very generally by the medical press of the country. This extensive republication may fairly be taken as expressive of a general approval of the position taken by Professor Wood.

Upon the questions of difficult dentition and gum-lancing, the medical world has been for some years divided, the smaller party taking the modern view that dentition is a normal process, and

rarely, if ever, produces dangerous symptoms, the larger party holding that dentition is responsible for most of the ills that infants suffer from, and that gum-lancing is its sovereign remedy. This latter view is one of our most ancient possessions, having come down to us from Hippocrates. For centuries it remained unquestioned, and has consequently become firmly intrenched in both the professional and the lay mind.

During the past summer this subject has occupied somewhat the attention of the Academy of Medicine of Paris. At the meeting of July 12, Magitot said, "We wish that the so-called diseases of dentition might be definitely erased from our medical nosology."

This brought a reply from M. Pamard on August 9, who took the following ground:

1. All difficult dentition is accompanied by a disturbance of the health of the infant.

2. In cold climates and in cold seasons all difficult dentition is accompanied by reflex phenomena on the part of the respiratory organs. In warm climates and in warm seasons all difficult dentition is accompanied by reflex phenomena on the part of the digestive organs.

3. The diseases allied to dentition in the infant pursue a course and present characteristics which are clearly defined and well established.

These propositions were supported only by the old argument of coincidence, but the essayist was upheld by MM. Le Roy de Mericourt, Herard, Charpentier, Peter, and Constantin Paul. He was opposed by MM. Ollivier and Hardy.

In the study of this question it is first necessary to separate dentition and gum-lancing. The first is a possible pathological condition, while the second is a therapeutic procedure.

We think it can be said without fear of contradiction that there is not a single positive observation which has ever been recorded to prove that dentition produces general or reflex symptoms. [Italics ours.] It is undeniable that at the period in life when dentition is in progress the infant is subject to certain disorders which occur much more commonly than at any other period of life.

If it could be shown that dentition was the only peculiarity of the infant, then its causative influence would be clear. But dentition is not the only peculiarity of the infant, and co-existing phenomena can only be classed as coincident. The most profound characteristic of infancy is that it is the period of most rapid growth and development of all organs; and careful observation of infants

reveals numerous and great deviations from the normal growth and development in many instances. It will probably not be denied that such deviations are found most commonly in infants who have been artificially fed. In infants improperly fed, and this term is too extensive to attempt to define here, reflex manifestations are very readily produced, and it is not improbable that even a normally developing tooth may, in such an infant, be the exciting cause of trouble. We have seen infants who would invariably have a bronchial attack immediately before the proruption of a tooth, but they have invariably been infants who were suffering from demonstrable deviations from normal nutrition. We have further found that after improving the nutrition of these infants, the further progress of dentition was unaccompanied by symptoms.

In such cases, while it would be just as well, perhaps, to recognize the possible influence of dentition, its subordinate importance should be kept clearly in view. The great danger of teething is in the diagnosis, for when this is once made, the important underlying conditions are apt to be neglected, and permitted to progress to the death of the child.

But if dentition cannot be shown to be the great etiological factor of infantile disorders, it does not follow that gum-lancing should be abandoned. It is difficult to overlook the numerous instances in which careful observers have thought they have obtained good results from its use, but it would be well also to bear in mind the many cases in which it has failed. As a therapeutic procedure, it may have some value, but the indications for its use must be sought elsewhere than in a supposititious condition of teething. We would like to offer the following conclusions:

1. Before the diagnosis of "teething" is made, there should first be carefully excluded organic disease of all organs,—infection, intoxication, and perversion of nutrition.

2. Gum-lancing as a therapeutic measure should stand on its own merits, and be studied apart from any supposititious and undemonstrable process of teething.—*Abstracts from Editorial in Journal of the American Medical Association.*

PROFESSOR HARRIS.

THE following abstracts from a letter in relation to some facts connected with Professor Harris, of Baltimore, will, no doubt, be interesting to those who look upon Dr. Harris as the father of modern dentistry. The letter is written by a daughter, Mrs. C. G. Burrett Lennard, of London. She says, speaking of the portraits extant of her father:

"We have several photographs, two of which my mother and sisters considered good, and there have been a good many portraits painted, but the one by Mr. Eastman Johnson, of New York, is, I imagine, the only one of artistic merit. It was, unfortunately, prepared after his death from photographs, aided, no doubt, by memory, as Mr. Johnson was an old friend. . . . It is like him, but conveys no idea of the man, but is rather that of a 'country squire,' if that English term conveys any impression. It looks like a handsome, hale, jolly sort of person, without any special mark of intellectual strength and spirituality. . . . My father was remarkably handsome and intellectual looking. . . . He was six feet two and a half inches, broad-shouldered, and finely proportioned. . . .

"At an early age my father was deeply impressed by a sermon at a Methodist Episcopal church, and was induced to join it. . . . He was a deeply religious man, very benevolent, and given to all sorts of good works. He was very large-minded, and so free from having sectarian bias, he numbered among his intimate friends Romish priests, Episcopalian clergymen, and men attached to various Protestant bodies. During his last illness they all visited him constantly, and once five of them, including a Romish priest, and the present bishop of Western New York, all chanced to meet on his door-step. He was especially fond of the Episcopal church, and was in the habit of going to it often. . . . My father died on Michaelmas-day, September 29, 1860. . . .

"My father was the youngest of three brothers, both of whom died long before him, and whose families are passed away. . . . My youngest uncle had two children,—a daughter . . . in Minnesota and a son in Kentucky. . . . These are all the relations on my father's side, except some cousins, daughters of his eldest sister."

Mrs. Lennard then denies that any one in Baltimore in the practice of dentistry can "claim relationship with us, . . . as they are not even *distantly* connected."

JAWS OF INEBRIATES.

HAVING thus found the cause, the question naturally arises, "Shall we not find as large a percentage defective among inebriates as other neurotics?" I have therefore examined the mouths of all of these classes. I will now give you the results of my investigations, taking them in the order in which they were made.

TABLE OF DEFORMITIES OF THE JAWS OF THE DEGENERATES.

	No.	Normal.	Large Jaw.	High Vault.	V-Shaped Arch.	Partial V-Shaped Arch.	Semi-V-Shaped Arch.	Saddle Arch.	Partial Saddle Arch.	Semi-Saddle Arch.
Idiots	1977	55.3	7.6	16.	6.5	11.9	. . .	10.4	. . .	. . .
Deaf and Dumb	1935	45.3	15.7	21.7	8.7	9.9	. . .	10.4	. . .	. . .
Blind	207	50.7	7.7	18.3	3.3	4.3	. . .	5 3	. . .	. . .
Insane	700	62.	18.	44.	26.	47.	. . .	12.	. . .	. . .
Criminal	477	36.06	15.72	14.67	2.7	16.56	3.9	12.36	19.28	5.03
Inebriates*	514	25.04	6.4	59.5	1.5	24.4	0.3	9.3	18.2	7.7
Normal	1000	78.	1.9	5.6	1.1	6.1	. . .	3.3	. . .	. . .

* The examination of inebriates was made in the Keeley Institute, Dwight, Ill.; the Inebriates Home, Ft. Hamilton, N. Y.; Washingtonian Home, Chicago; Washingtonian Home, Boston; and Dr. Crothers's Institute, Hartford, Conn.

It will be observed that there is a larger percentage of deformities among the inebriates than among any other defective class.

These deformities, however, are not so *pronounced* as those found among the idiots and criminal classes. The large percentage of deformities and high vaults indicate a strong neurotic tendency early in life, even before the seventh year. Finally, if the child from the seventh to the twelfth year has arrested development of the superior maxilla, and possesses constitutional irregularities of the teeth and a high vault, we can almost invariably say that the individual will become, not always an idiot, but a genius in some one direction or an idiot, deaf, dumb, blind, insane, a criminal, an extreme egotist, excessive tobacco user, or an inebriate,—all of these conditions coming under the head of degenerates, or neurotics. In making a diagnosis of any one of these classes of individuals mentioned, we should always take into account these three conditions of deformities of the jaws,—viz., arrest of development of the superior maxilla, constitutional irregularities of the teeth, and high vaults.—DR. EUGENE S. TALBOT, *Journal of the American Medical Association.*

DEATH UNDER PENTAL.

The death of a German opera-singer is reported by the *British Medical Journal*, July 9, 1892, to have recently occurred after the administration of pental for the extraction of a tooth. Eight or ten drops were given upon a face-piece and the tooth removed, whereupon the patient fell back with a loud shriek and never recovered consciousness, attempts to restore animation proving of no avail. The official examination showed that the brain, lungs, and vessels were healthy; there was, however, some amount of fatty degeneration of the heart, and death was attributed to syncope, probably due to the condition of that organ.—*New York Medical Record.*

EXAMINATION OF SOME COMMERCIAL VARIETIES OF HYDROGEN DIOXIDE.

BY HENRY LEFFMANN, M.D., AND WILLIAM BEAM, M.D., PHILADELPHIA.

Hydrogen dioxide, generally inaptly called hydrogen peroxide, has found, in recent years, many valuable applications in preventive medicine and therapeutics. The pure article being very difficult to prepare and preserve, the commercial forms consist of dilute solutions in water, containing a very small amount of actual dioxide. Since the medicinal value of the article depends on its strength and freedom from impurities, it is important to make some comparative determinations on these points of the brands of hydrogen dioxide now offered in the market. The tests employed have been frequently described, and it will not be necessary to repeat them here. Among the impurities, free acid is the most objectionable, on account of its irritating action.

Comparative tests of commercial brands have from time to time been published in medical and pharmaceutical journals, but usually without indication of the identity of the samples, and, therefore, of but little practical value. In judging of the strength of any sample, the unavoidable liability to decomposition must be regarded. On the other hand, the proportion of free acid and of metallic salts will not be appreciably affected by the lapse of time.

In the following examination care was taken to secure fresh samples, and they were all in the original, unbroken packages when delivered to us. The proportion of hydrogen dioxide is expressed,

as is customary, in volumes of oxygen, determined by the standard method with potassium permanganate:

Brand.	Volumes of oxygen.	Barium salts.	Earthy salts other than barium.	Acidity expressed in milligrammes of KHO required for 25 c.c. of sample.
O. C. (Oakland Chemical Company)	15.6	None.	None.	3.8
Béné	11.8	"	"	3.36
Lehn & Fink	10.5	"	"	4 08
Marchand (first sample)	10.1	"	Present.	34.08
" (second sample)*	Not determined.	"	None.	22.
Powers & Weightman	9.02	"	"	23.04
Merck	12.09	"	Large amount.	16.32
Mallinckrodt	9.14	"	Traces.	8.64

* This sample was one that had been purchased from some laboratory experiments in bleaching, and having been kept without any precautions to preserve its strength, the determination of the volume of O would have been of no value in indicating the original quality; but since the amount of free acid and earthy salts will not be affected by such treatment, they were determined. The volume strength claimed for the sample originally was less than that claimed for sample No. 1.

—*Medical News.*

CHEMISTRY OF THE CHOLERA BACILLUS.

At a recent meeting of the French Academy of Sciences, attention was directed by M. Ferran to the fact that the *Bacillus mastitidis* (Guillebeaux), the *streptococcus mastitidis sporadiæ*, the *streptococcus scarlatinæ*, the *Bacillus diphtheriæ*, the *Bacillus coli communis*, the *Bacillus ovale ilei*, the *Bacillus Gaffky*, and the *Bacillus Schardingerii* determine the fermentation of milk, and, by their action on the lactose, the production of paralactic acid, with this peculiarity: that the acid produced by them is dextro-rotary, while that produced by others is lævo-rotary. When the comma bacillus is cultivated in a slightly alkaline bouillon, containing lactose, paralactic acid is produced in quantity sufficient to render the liquid distinctly acid. When this microbe

is sown upon agar that is slightly alkaline, and containing lactose as well as litmus, the medium becomes red from the production of paralactic acid. A cultivation in a slightly alkaline bouillon, containing lactose, presents, after being left at rest at 30° C. for five days, a floating mycoderm, consisting of large comma bacilli, in the interior of which may be seen one or two very small granulations analogous to spores; eventually all the protoplasm of the bacillus disappears, leaving exposed these small granulations, which are readily colored by methyl-violet. The same comma bacillus of cholera sown in a small quantity of alkaline bouillon, contained in a capacious flask, may remain alive for more than three years, provided that the flask is closed by cotton-wool, which will allow of the renewal of the air. Under the very same conditions, and with the sole difference that the bouillon contains some lactose, the vitality of the microphyte is rapidly extinguished by reason of the acid character communicated to the medium by its own action. In ordinary culture bouillons the growth of this microbe is always rapid and luxuriant; but when the bouillon contains lactose it is disproportionately less prolific. The colonies become very numerous in consequence of the addition of that substance within a few hours; but the growth ceases completely as soon as the medium becomes acid, and before long the vitality of the microbe is destroyed. M. Ferran remarks that it is for medical men to deduce from these facts whatever rational indications they may contain in regard to the treatment of cholera. His present object is to call attention to the resemblances which obtain between the chemical function of this microbe and that of *Bacillus coli communis*. In many particulars their pathogenic functions are also similar. Paralactic acid paralyzes the chemical activity of both. The known value of that acid as a remedy for the diarrhœa caused by *Bacillus coli* suggests the probability that its administration in cases of diarrhœa caused by the comma bacillus might be equally efficacious and beneficial. M. Ferran therefore thinks that as a remedy for cholera it would be reasonable to administer lactic acid in the form of lemonade, and to assist its action by the anexosmotic power that is offered by morphine, which might probably prevent the absorption of toxines and prolong the influence of the lactic acid by reducing the rapidity of its elimination.—*Pharmaceutical Journal.*

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